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FINAL
SITE INSPECTION PRIORITIZATION REPORT
HUMMEL CHEMICAL
NEWARK, NEW JERSEY

CERCLIS ID No.: NJD002174712

2 September 1994

Work Order No.: 04200-016-081-0098

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

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GENERAL DESCRIPTION AND SITE HISTORY

The Hummel Chemical site (CERCLIS ID No. NJD002174712) is located within a small industrial park (the Foundry Street Complex) located at 185 Foundry Street, in a heavily industrialized section of Newark, Essex County, New Jersey. Hummel Chemical Company (Hummel) formerly operated a chemical warehousing/distribution center at the site from the mid-1950s to the mid-1960s. Available background information indicates that Hummel leased the property from Norpak/Kem Realty Company during the mid-1960s. Subsequently, Hummel moved its operations to South Plainfield, New Jersey. The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) lists Hummel-Lanolin Co. as Hummel's alias. There is a reported former Hummel-Lanolin facility located adjacent to the Foundry Street Complex; however, a site inspection conducted by the New Jersey Department of Environmental Protection and Energy Division of Hazardous Waste Management Bureau of Planning and Assessment (NJDEPE/DHWM/BPA) states that Hummel-Lanolin is not related to Hummel Chemical Co. The NJDEPE/DHWM/BPA also refers to the site as the 185 Foundry Street site (Ref. Nos. 1; 2, pp. 1, 2, 16).

The Foundry Street Complex is comprised of approximately 30 buildings which are in close proximity to one another. These buildings are separated by alleyways which were reported to receive surface runoff, and in some cases, direct discharges from some of the facilities. These alleyways are bisected by common storm drains. The complex is mostly covered with concrete or asphalt; however, there are several exposed surfaces. The exact building that Hummel occupied within the complex is unknown; however, Hummel officials speculated that it was Building No. 18 (Ref. No. 2, pp. 1, 87, 88). The exact location of Building No. 18 within the complex is also unknown.

The Foundry Street Complex has a long history of occupancy by a variety of chemical-related industries dating back to 1931. In the early 1930s H.A. Metz Laboratories manufactured unspecified drugs on site. In the 1950s, at least two companies (Chemical Industries Inc. and Arkansas Chemical Company) occupied the site. Operations at Chemical Industries Inc. are unknown. Background information indicates that they may have leased portions of the property to other chemical companies. Arkansas Chemical manufactured textile related chemicals in the extreme southern portion of the site until 1982. Other past operators within the Foundry Street Complex included Cellomar (a Division of Polychrome, Inc.), Diamond Shamrock, Essex Chemical Company, Coronet Chemical Company and Honig Chemical. Background information does not indicate the dates of operation for these companies nor the types of operations which occurred on site. Current operators at the Foundry Street Complex include Sun Chemical Company, Avon Drum Company, Fleet Auto Electric, Automatic Electroplating, Conus Chemical Company and CWC Industries (Ref. No. 2, pp. 1, 87).

During its occupancy on site, Hummel operated a warehouse/distribution center for the wholesaling of chemicals. Background information does not indicate the exact operations or storage/disposal methods utilized at the site; however, it does state that it is likely that operations included the reacting and mixing of chemicals, most of which were in the powdered form. The U.S. Environmental Protection Agency's publication "Dioxins" (EPA-600/2-80-197, November 1980) lists several Class III dioxin precursors as having been present at Hummel's Newark, New Jersey location. These compounds included 2,4-dinitrophenoxyethanol, 3,5-dinitrosalicylic acid, hexachlorobenzene and picric acid. It is unknown as to what other substances may have been present on site. Substances used at Hummel's South Plainfield facility, which are suspected to have also been used at the Newark facility, include the following:

2,4-dinitrophenol	hydrazine	rosin acid
hexachloroethane	lead nitrate	sodium hydroxide
lead dioxide	lead chromate	toluene
barium chromate	zinc oxide	resorcinol
ethylene glycol	arsenic	cupric oxide
isopropanol	ammonium oxalate	methanol
nitric acid	oxalic acid	acetone
antimony trisulfide	lead thiocyanate	

Background information indicates that Hummel did not possess any federal or state permits for groundwater or surface water discharges from their Newark facility. It is believed that poor housekeeping and operational practices may have occurred at the Newark facility as Hummel had a history of such practices at their South Plainfield facility (Ref. No. 2, pp. 1, 2, 57, 58, 62-67). For the purposes of this report, contaminated soil will be evaluated as the waste source for this site.

On 7 October 1988 a Presampling Assessment (PSA) of the Foundry Street Complex was conducted by the NJDEPE/DHWM/BPA. During this assessment, most of the exposed soil at the site appeared to be stained and saturated with chemicals. Pools of multicolored chemicals were observed as well as drums of hazardous substances. Several leaking drums were observed to be present in unsecured areas which lacked secondary containment (Ref. No. 2, pp. 87, 88).

On 14 October 1988, the NJDEPE/DHWM/BPA conducted a sampling site inspection of the Foundry Street Complex, during which 15 soil, 4 surface water, and 5 sediment samples were collected from various portions of the site. These samples were analyzed for Hazardous Substance List plus 30 peaks (HSL + 30) which included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides and metals. In addition, five soil samples were collected for analysis of the dioxin isomer 2,3,7,8-tetrachlorodibenzo-1,4-dioxin (2,3,7,8-TCDD). Field quality assurance/quality control (QA/QC) samples included one field blank and one trip blank. Background information indicates that all samples were analyzed by Weston Analytical Laboratories. The sampling strategy implemented by NJDEPE/BPA was to evaluate the entire complex as one site. This was due to the close proximity of the various industries to one another as well as the fact that the exact location of the Hummel facility was not known (Ref. No. 2, pp. 89-104).

Several VOCs, SVOCs, pesticides, PCBs, metals and cyanide were detected in sediment samples collected from drainage ditches between several of the facilities. VOCs, SVOCs, pesticides and cyanide were detected in surface water samples collected from these drainage ditches. VOCs, SVOCs, pesticides, PCBs and metals were also detected in surface soil collected at various locations throughout the site (Ref. No. 2, pp. 3, 5-13). The dioxin isomer was not detected in any of the soil samples collected (Ref. No. 2, p. 3). Original data sheets for samples collected during the site inspection were not available in background information.

In the Site Inspection report completed by the NJDEPE/DHWM/BPA (dated December 1989) the site was assigned a low priority. Although several organic and inorganic contaminants were detected on site, the NJDEPE/DHWM/BPA concluded that the on-site contamination could not be attributed to Hummel's operations. This was due to Hummel's absence from the complex since the mid-1960s. It was further recommended that a responsible party (RP) search be conducted to identify previous owners and tenants. Following the RP search, it was recommended that the case be transferred to the NJDEPE/Bureau of Case Management for the initiation of cleanup activities (Ref. No. 2, p. 4). Background information does not indicate that any remedial activities have taken place since the NJDEPE/DHWM/BPA site inspection.

EVALUATION OF EXISTING INFORMATION AND SITE INSPECTION REPORT

Existing information, primarily from the December 1989 NJDEPE/DHWM/BPA Site Inspection report and supporting documentation file, were used to conduct an evaluation of the site. Updated information was collected to determine whether any remedial action under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) is warranted. Specifically, the groundwater migration pathway was updated to include wells within 4 miles of the site, and the surface water migration pathway was updated to include receptors within 15 miles downstream of the site. The air migration pathway was evaluated with respect to sensitive environments, including threatened and endangered species, and 1990 census population data.

HAZARD ASSESSMENT

Groundwater Migration Pathway - A release to groundwater from the Hummel site is not observed or suspected. During the NJDEPE/DHWM/BPA Site Inspection, benzene and several metals were detected in monitoring wells located at the Hummel-Lanolin facility (not related to Hummel Chemical); however, these contaminants cannot be attributed to Hummel as it has not operated at the facility since the mid-1960s and its exact former location within the Foundry Street Complex is unknown (Ref. No. 2, pp. 1, 2). Class III dioxin percusors are the only contaminants known to have been present at the Hummel facility. Groundwater samples were not analyzed for dioxins; however, analysis of five surface soil samples collected during the site inspection did not indicate the presence of the dioxin isomer 2,3,7,8-TCDD.

The aquifer of concern is the Passaic Formation of the Newark Supergroup. The Passaic Formation corresponds to the pre-basaltic part of the unit formerly known as the Brunswick Formation. Generally, the Passaic Formation consists predominantly of siltstone, sandstone and conglomerate. It underlies most of Essex County and has a calculated total thickness of 6,000 meters (19,680 feet) (Ref. Nos. 4; 5). The hydraulic conductivity of the water-bearing fracture zones is approximately 10^{-4} centimeters per second (cm/sec) (Ref. No. 6). In the southern part of the county, east of the Watchung Mountains (where the site is located), the aquifer of concern, consists locally of soft, red shale. Overlying bedrock in the area of the site are unconsolidated deposits of unstratified drift, known as till or ground moraine. Till consists of a heterogenous mixture of clay, silt, sand, gravel, cobbles and boulders. The thickness of these unconsolidated deposits, and therefore the depth to bedrock, is 65 feet near the site (Ref. Nos. 4; 5). The hydraulic conductivity of the till is approximately 10^{-6} to 10^{-8} cm/sec. Groundwater at the site has been encountered at 8.5 feet below ground surface (Ref. No. 2, p. 2). Local groundwater flow is expected to be to the east-southeast toward the Passaic River and Newark Bay (Ref. No. 3). Within 4 miles of the site, the Passaic Formation is only used for commercial and industrial supply. Groundwater is not used for potable purposes within 4 miles of the site (Ref. No. 8). There are no wellhead protection areas delineated in New Jersey (Ref. No. 7).

Surface Water Migration Pathway - A release to surface water is not observed, nor is one suspected. Analytical results from the October 1988 NJDEPE/DHWM/BPA site inspection indicate the presence of VOCs, SVOCs, PCBs, pesticides, metals and cyanide in drainage ditches between several of the facilities. As Hummel has not operated on site since the mid-1960s and its exact former location is unknown, it is difficult to attribute current site conditions to Hummel (Ref. No. 2, pp. 3, 5-13). Surface runoff from the site enters common storm drains within the Foundry Street Complex. These storm drains discharge to a combined sanitary/stormwater system. However, when these systems are in an overflow condition, stormwater is discharged to an overflow facility which discharges to the Passaic River approximately 0.5 mile east of the site (Ref. Nos. 2, p. 3; 9; 10). This location will be evaluated as the probable point of entry (PPE) of contaminants from the Hummel Chemical site. From the PPE, the surface water migration pathway continues from the Passaic River south through the Newark Bay. At the southern portion of the Newark Bay, the surface water migration pathway splits, with the western branch flowing to the south, where the pathway ends in the Arthur Kill. The eastern branch of the 15-mile surface water migration pathway flows east through the Kill Van Kull and then south, where the pathway ends in the Narrows. (Ref. Nos. 9; 10).

There are no potable surface water intakes within 15 miles downstream of the PPE (Ref. No. 10). The entire in-water segment of the surface water migration pathway consists of coastal tidal waters (Ref. No. 9). In addition, all water bodies within the 15-mile surface water migration pathway are fisheries (Ref. No. 10). There are approximately 1.8 miles of estuarine wetland along the surface water migration pathway, with the nearest frontage existing approximately 1.9 mile downstream of the PPE (Ref. Nos. 9; 10). One State-listed endangered species [least tern (*Sterna antillarum*)] exists on or in the immediate vicinity of the associated waterways within the 15-mile surface water migration pathway. All surface waters within 15 miles of the PPE are designated for the maintenance and migration of fish populations (Ref. No. 11). The site is located within the boundary of the 100-year floodplain (Ref. No. 10).

Soil Exposure Pathway - Analytical results from the October 1988 Site Inspection conducted by the NJDEPE/DHWM/BPA indicate that there is on-site soil contamination. VOCs, SVOCs, pesticides, PCBs and metals were detected in on-site soils; however, these contaminants are difficult to attribute to Hummel, as the company has not operated on site since the mid-1960s and its exact former location is unknown. The dioxin isomer 2,3,7,8-TCDD, which may have been associated with Hummel's operations, was not detected in any of the five soil samples collected during the Site Inspection (Ref. No. 2, p. 3). The site is reported to be mostly covered with concrete or asphalt; however, there are many exposed surface which are stained from spills and leaks of chemicals (Ref. No. 2, p. 38). There are no residences, schools, or day care centers within 200 feet of the site (Ref. Nos. 2, p. 1; 3). There are no known terrestrial sensitive environments on areas of observed contamination within the Foundry Street Complex (Ref. Nos. 3; 11).

Air Migration Pathway - A release of contaminants to air is not observed or suspected. No sampling of the ambient air is known to have been conducted; therefore, there is no documented release of contaminants to air. During the PSA conducted by NJDEPE/DHWM/BPA in October 1988, soil gas readings on site ranged from 10 units to over 1,000 units on the organic vapor analyzer (OVA) and from background to over 600 units on the HNu photoionization detector. Ambient air readings of up to 10 units on the OVA and 40 units on the HNu were recorded during the PSA (Ref. No. 2, pp. 3, 88). However, Hummel has not operated on site since the mid-1960s. Background information does not indicate the number of workers within the

Foundry Street Complex; therefore, for the purposes of this report, the number of workers on site is estimated to be less than 100 based on the size of the complex. Approximately 420,330 people live within 4 miles of the site (0-¼ mile: 70; ¼-½ mile: 2,640; ½-1 mile: 8,410; 1-2 miles: 43,830; 2-3 miles: 133,560; 3-4 miles: 231,820) (Ref. No 1). Three State-listed endangered species habitats, one State- and federal-listed endangered species habitat, and State-listed threatened species habitat, and one habitat of a species which is federally proposed as either endangered or threatened exist between 0.5 and 4 miles of the site (Ref. No. 11). There are approximately 600 acres of wetlands within 4 miles of the site (0-¼ mile: 0; ¼-½ mile: 1; ½-1 mile: 0; 1-2 miles: 140; 2-3 miles: 250; 3-4 miles: 210) (Ref. No. 11).

SUMMARY

The existing information, data and additional information collected were sufficient to evaluate the site. This assessment indicated that the site poses a minimal threat to receptors in the vicinity of the site. Although there is a minimal amount of observed soil contamination on site, it is difficult to attribute any contamination to Hummel, as Hummel has not operated on site since the mid-1960s. In addition, the exact location of the former Hummel facility is unknown. Groundwater is not used for potable purposes within 4 miles of the site. Surface runoff within the Foundry Street Complex flows to common storm drains which discharge to a combined sanitary/storm water system, except in the case of overflow conditions, when storm water is diverted to an overflow facility which discharges to the Passaic River. The dilution potential of the Passaic River as well as that of the coastal tidal waters within the 15-mile surface water migration pathway minimizes the potential for a release to impact downstream receptors. Although there is observed soil contamination, there are no residences, schools, or day care centers within 200 feet of the site.

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Document Control No.: 4200-16-AEQB

REFERENCES

1. U.S. EPA Superfund Program, Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), List-4: Site Alias Location Listing, p. 130; and List-8: Site/Event Listing, p. 129, June 6, 1994.

ORIGINAL IS IN THE EPA SITE FILE (104 PAGES)

* 2. Site Inspection Report, Hummel Chemical, a.k.a 185 Foundry Street Site, prepared by the NJDEPE/DHWM/BPA, December 1989.

3. Four-Mile Vicinity Map for Hummel Chemical, based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series "Elizabeth, NJ-NY" Quadrangle, 1967, photorevised 1981; "Jersey City, NJ-NY" Quadrangle, 1967; photorevised 1981; "Weehawken, NJ-NY" Quadrangle, 1967, photorevised 1981; and "Orange, NJ" Quadrangle, 1955, photorevised 1981.

4. Olsen, Paul E. The Latest Triassic and Early Jurassic Formations of the Newark Basin (Eastern North America, Newark Supergroup): Stratigraphy, Structure, and Correlation; New Jersey Academy of Science Bulletin, Volume 25, No. 2, 1980.

5. Nichols, William D. Groundwater Resources of Essex County, New Jersey. Special Report No. 28. State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, 1968.

6. Federal Register, Environmental Protection Agency, 40 CFR Part 300, Hazard Ranking System; Final Rule, Volume 55, No. 241, December 14, 1990.

7. Phone Conversation Record: Conversation between Terry Romogna, NJDEPE, and Keith Bobrowski, Roy F. Weston, Inc. (WESTON), November 29, 1993.

8. Project Note from Dennis Foerter, WESTON, to Hummel Chemical file, Subject: Groundwater use within 4 miles of Hummel Chemical site, July 20, 1994; plus attachments.

9. Fifteen-Mile Surface Water Pathway Map for Hummel Chemical compiled from the following U.S. Department of the Interior, Fish and Wildlife Services, National Wetland Inventory Maps, 7.5 minute series, Quadrangles of "Elizabeth, NJ,-NY", 1976; "Jersey City, NJ-NY", 1976; "Weehawken, NJ-NY", 1976; "Orange, NJ", 1976; "Arthur Kill, NY-NJ", 1976; and "The Narrows, NY-NJ", 1976.

REFERENCES (CONTINUED)

10. Project Note from Dennis Foerter, WESTON, to Hummel Chemical file, Subject: Surface Water Migration Pathway for Hummel Chemical, July 20, 1994; plus attachments.

11. Project Note from Dennis Foerter, WESTON, to Hummel Chemical file, Subject: Sensitive Environments (Hummel Chemical), July 20, 1994; plus attachments.

12. Letter from Bob Frost, Frost Associates, to Jan Holderness, WESTON, June 9, 1994; (population data attached).

REFERENCE NO. 1

SEQUENCE: REG, ST, SITE NAME
REGION: 02

EPA IDENTIFICATION NUMBER	SITE NAME/ALIAS NAME STREET/ALIAS STREET CITY/ALIAS CITY COUNTY NAME	STATE/ALIAS STATE COUNTY CODE	ZIP CODE	ALIAS SEQ. #	NAME SOURCE	FEDERAL FACILITY FLAG	CONGRESSIONAL DISTRICT (S)
NJD991290701	HOWMET ALLOY				EPA	N	
	ROY ST						
	ROCKAWAY TWP	NJ	07801				
	MORRIS	027					
	HOWMET TURBINE COMPONENTS CORP.			01			
NJD980530190	HOYT METAL CO				NOTIS	N	
	231 STATE ST						
	PERTH AMBOY	NJ	08861				
	MIDDLESEX	023					
NJD002151538	HUDSAR INC					N	
	373 SOUTH STREET						
	NEWARK	NJ	07105				
	ESSEX	013					
NJD002174712	HUMMEL CHEMICAL				EPA	N	
	185 FOUNDRY ST						
	NEWARK	NJ	07101				
	ESSEX	013					
	HUMMEL LANOLIN CO			01			
NJD044081222	HUMMEL CHEMICAL CO INC				EPA	N	
	10 HARMICH RD						
	SOUTH PLAINFIELD	NJ	07080				
	MIDDLESEX	023					
NJD986649770	HUMPHREY'S PEST CONTROL					N	
	RTE 561 BLACKHORSE PK						
	FOLSOM BOROUGH	NJ	08037				
	ATLANTIC	001					
NJD075484139	HYDROCARBON RESEARCH INC				EPA	N	
	NEW YORK AND PURITAN AVENUES						
	LAWRENCEVILLE	NJ	08648				
	MERCER	021					
NJ4680019987	I.T. CORPORATION					Y	
	GSA RARITAN DEPOT						
	EDISON	NJ	08817				
	MIDDLESEX	023					

*

SEQUENCE: REG, ST, SITE NAME
REGION: 02

SELECTION:
SEQUENCE: REGION, STATE, SITE NAME

EVENTS: ALL

EPA ID NO.	SITE NAME / STREET / CITY / COUNTY CODE AND NAME	STATE ZIP CONG DIST.	OPRBLE UNIT	EVENT TYPE	EVENT QUAL	ACTUAL START DATE	ACTUAL COMPL DATE	CURRENT EVENT LEAD
NJD002151538	HUDSAR INC		00	RV1		02/25/93	04/23/93	EPA (FUND)
	373 SOUTH STREET							
	NEWARK	NJ 07105						
	013 ESSEX							
NJD002174712	HUMMEL CHEMICAL		00	DS1			04/10/84	STATE(FUND)
	185 FOUNDRY ST			PA1		09/29/87	09/30/87	STATE(FUND)
	NEWARK	NJ 07101		SI1		11/01/89	12/31/89	STATE(FUND)
	013 ESSEX							
NJD044081222	HUMMEL CHEMICAL CO INC		00	DS1			01/01/84	EPA (FUND)
	10 HARMICH RD			PA1			01/01/84	STATE(FUND)
	SOUTH PLAINFIELD	NJ 07080		SI1		07/01/90	09/25/90	EPA (FUND)
	023 MIDDLESEX							
NJD986649770	HUMPHREY'S PEST CONTROL		00	DS1			05/19/93	STATE(FUND)
	RTE 561 BLACKHORSE PK			PA1			08/19/93	STATE(FUND)
	FOLSOM BOROUGH	NJ 08037						
	001 ATLANTIC							
NJD075484139	HYDROCARBON RESEARCH INC		00	DS1			04/10/84	STATE(FUND)
	NEW YORK AND PURITAN AVENUES			PA1		05/01/85	06/01/85	STATE(FUND)
	LAWRENCEVILLE	NJ 08648		SI1		06/23/88	06/30/88	STATE(FUND)
	021 MERCER							
NJ4680019987	I.T. CORPORATION		00	DS1			06/06/89	EPA (FUND)
	GSA RARITAN DEPOT			PA1			09/18/89	EPA (FUND)
	EDISON	NJ 08817						
	023 MIDDLESEX							
NJD002177210	IBM		00	DS1			12/01/77	EPA (FUND)
	CULVER RD			PA1			04/01/80	EPA (FUND)
	DAYTON	NJ 08810		SI1		02/01/83	02/01/83	EPA (FUND)
	023 MIDDLESEX			SI2			06/27/90	STATE(FUND)

REFERENCE NO. 2

HUMMEL CHEMICAL
AKA 185 FOUNDRY STREET SITE
185 FOUNDRY STREET
NEWARK, ESSEX COUNTY
EPA ID # NJD002174712

GENERAL INFORMATION AND SITE HISTORY

The Hummel Chemical Company formerly operated a chemical warehouse/distribution center out of a small industrial complex from the mid-1950s to the mid-1960s. Operations ceased here in the mid-1960s when the company relocated to South Plainfield, New Jersey. The former site is situated in a heavily industrialized section of Newark with the nearest residential area being located 0.5 mile to the west.

Records show that Hummel leased property at 185 Foundry Street from Norpak/Kem Realty Company in the mid 1960's. The exact building that Hummel occupied cannot be verified; however, company officials speculate that it was building #18.

The entire Foundry Street Complex has a long history of occupancy by a variety of chemical related industries dating back to a least 1931. In the early 1930's H.A. Metz Laboratories manufactured unspecified drugs here while the northeastern portion of the site remained undeveloped. In the 1950s, at least two industries, Chemical Industries Inc. and the Arkansas Chemical Company occupied the site. The type of operations that Chemical Industries Inc. was involved in is unknown; however, they may have leased some portions of their property to other chemical companys. Arkansas Chemical manufactured textile related chemicals in the extreme southern portion of the site until 1982. Other past operators include Cellomar, a Division of Polychrome Inc. and Diamond Shamrock. The dates these companies operated here and types of operations are unknown.

Current operators at the Foundry Street Complex include: Sun Chemical Company, Avon Drum Company, Fleet Auto Electric, Automatic Electroplaing, Conus Chemical Company and CWC Industries.

SITE OPERATIONS OF CONCERN

Hummel Chemical operated a chemical warehouse/distribution center for wholesaling chemicals out of their Foundry Street, Newark location. Although little information is available as to the exact operations here, it is likely that they included the reacting and mixing of chemicals, most of which were in the powered form.

According to the EPA publication, "Dioxins", published in 1980, several class III dioxin precursors were present at the Newark location. These chemicals include: 2,4-dinitrophenoxyethanol, 3,5-dinitrosalicylic acid, hexachlorobenzene and picric acid. The identity of additional chemicals present or what types of storage/disposal methods used by the company are unknown.

The company has a history of poor housekeeping and operational practices associated with their South Plainfield facility that may have also occurred at the prior operational facility in Newark.

Hummel possessed no state or federal permits for discharges to the environment from their Newark facility.

During an October 7, 1988 Presampling Assessment (PSA) conducted by New Jersey Department of Environmental Protection (NJDEP), Bureau of Planning and Assessment (BPA) personnel, most of the exposed soil surface at the site appeared to be stained and saturated with chemicals. Pools of multi-colored chemicals were observed as well as drums of hazardous substances, many of which were leaking and stored in insecure areas which lacked secondary containment. For most industries within the complex, poor housekeeping practices seemed to be routine.

Because a variety of chemical companies have operated here since Hummel moved in the 1960s, it is unlikely that current conditions can be attributed to Hummel.

GROUNDWATER ROUTE

Groundwater beneath the site is derived from a two aquifer system. Directly underlying the site is a low yield aquifer consisting of unstratified drift of the Pleistocene age. During an October 14, 1988, NJDEP Site Investigation (SI), groundwater in this aquifer was encountered at 8.5 feet. The groundwater flow in this shallow unconfined aquifer is assumed to be east, southeast towards the Passaic River and Newark Bay. The Triassic Brunswick Formation, which consists of dull red shale interbedded with siltstone and occasional layers of sandstone, is found beneath the unstratified drift. The formation is relatively deep and protected in much of the area by confining clay layers; however, moderate permeability is possible due to extensive fracturing. Because cracks in the sedimentary rocks of the Triassic Age intersect one another at many different angles, water can move in any direction.

Two monitoring wells were sampled during the October 14, 1988, NJDEP SI. Monitoring Wells 1 and 2 are located on the former Hummel-Lanolin (not related to Hummel Chemical) property within 50 feet on one another in order to monitor a former underground storage tank. Monitoring Well 1 is 10.5 feet deep while Monitoring Well 2 is 10.7 feet deep with both wells tapping the shallow unstratified drift-aquifer. Because of the extremely slow recharge rate of the groundwater in this area, the monitoring well samples were analyzed only for Volatile Organic Compounds (VOCs) and metals out of the planned Target Compound List (TCL) plus 30 peaks.

The following table represents the significant monitoring well results: (note: all results in ppb)

	MW-1	MW-2
benzene	6	4
arsenic	2020	
barium	2200	
cadmium	1530	34.9
copper	2660	
lead	20400	127
mercury	4.2	77.1
zinc	51500	84600

There are numerous industrial wells within a three mile radius that tap the Brunswick Formation, however, groundwater is not used as a potable supply source in the area. Hummel has never possessed any permits or been issued violations for dicharges to the groundwater associated with the former Newark facility.

SURFACE WATER ROUTE
The Foundry Street Complex consists of buildings that are in close proximity to each other, separated only by small alleyways. These alleyways run throughout the site and are bisected by common storm drains, which receive stormwater runoff and, in some cases, direct discharges from the various industries. Because the industrial complex is so old, it is not known which, if any, of the storm drains are connected to the Passaic Valley Sewage Authority (PVSA). Any discharges or drains that are not connected would most likely discharge into the nearby Passaic River.

The confluence of the Passaic River, Hackensack River and Newark Bay lies approximately 3000 feet to the east of Foundry Street Complex. These waterways are used for industrial, recreational and commercial purposes.

During the October 14, 1988, NJDEP SI, four surface water and five sediment samples were collected from the storm drains and analyzed for the TCL plus 30 peaks. Numerous contaminants were detected at varying concentrations in both the surface water and sediment samples. Table 1 summarizes the significant results. (note: all results in ppb with the exception of the non-aqueous inorganics which are reported in ppm) See Map 2 for sample locations and Attachment A for sample descriptions.

Because Hummel has not operated here for 25 years, the contamination detected in these samples cannot accurately be connected to their prior operations.

AIR ROUTE
Hummel did not possess any permits or receive any violations for releases to the air from the Newark facility. Since their operations in Newark ceased in the mid-1960s there is currently no potential for contamination of the air; however, migration of air-borne contaminants in the past cannot be ruled out.

During the October 14, 1988, NJDEP SI, ambient air readings of up to 40 ppm as isobutelyne on the HNu and over 10 ppm as methane on the OVA were observed. This would indicate that current operations may be contributing to air pollution.

SOIL
On October 14, 1988, NJDEP, BPA collected 15 soil samples to be analyzed for the TCL plus 30 peaks and 5 to be analyzed for the 2,3,7,8-TCDD isomer of dioxin. Although dioxin was not detected in any of the samples, this does not guarantee that it is not present on site. See Map 2 for sample locations and Attachment A for sample descriptions. Table 2 summarizes the significant results.

During the same inspection, the ground surface was observed to be stained throughout the site from chemical spills. Leaking drums with no secondary containment were also noted.

Because of the presence of a variety of chemical companies over the years, it is not likely that any present soil contamination can be attributed to the former Hummel facility.

DIRECT CONTACT
There have been no reported incidents of direct contact in relation to the Hummel operations at this location; however, there is currently a potential for direct contact with contaminanted soil due to the absence of 24-hour barriers.

FIRE AND EXPLOSION
There have been no reported fires or explosions directly associated with the Hummel, Newark operations; however, Newark Fire Department personnel recall responding to fires and chemical spills at the Foundry Street Complex but could not recall if any were at the Hummel facility.

ADDITIONAL CONSIDERATIONS
The presence of many bioaccumulative and biomagninfication threats such as pesticides, PCBs, mercury, cadmium, and lead in the surface water and soil leads to a potential to damage the flora and fauna and subsequently adversely affecting the food chain. The aquatic ecosystem of the Passaic River, which receives the drainage discharges, would be most immediately affected.

ENFORCEMENT ACTIONS
There are no records of enforcement actions taken against the Hummel, Newark facility.

PRIORITY DESIGNATION
Because damage to human health or the environment is not likely due to the location of the site in a highly industrialized area, a low priority is assigned.

RECOMMENDATIONS
Further investigation of the current operators at the Foundry Street Complex is indicated by the levels of contaminants detected during the October 14, 1988 NJDEP SI. A Responsible Party (RP) search is necessary due to the number of tennants and owners over the years. Following completion of the RP search, the case should be transferred to Case Management for initiation of clean-up activities.

A delineation of the storm drain system should be performed and, if necessary, hook up to the PVSA should be completed.

Submitted by:

Elizabeth Torpey
December, 1989

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TABLE 1

RESULTS IN PPB	SW-1	SW-2	SW-3	SW-4	SED-1	SED-2	SED-3	SED-4	SED-5
VINYL CHLORIDE					29				
METHYLENE CHLORIDE									9900
ACETONE									25000
CARBON DISULFIDE								14	
1,1-DICHLORETHANE				15	2			16	7100
1,2-DICHLOROETHENE				270	5			58	81000
1,2-DICHLOROETHANE									5300
2-BUTANONE						660			5000
1,1,1-TRICHLOROETHANE					12	110			15000
XYLENES	53				200	1800	14	280	99000
TRICHLOROETHENE				7	36			27	3100
BENZENE		.7	7	43		7		7	520
4-METHYL-2-PENTANONE				57		3300			
TETRACHLOROETHENE					3	15		7	10000
TOLUENE	11	.9	4	120	10	130	100	53	96000
CHLOROBENZENE			39	77	32	160	34	970	33000
ETHYLBENZENE	6				35	170		42	
1,3-DICHLOROBENZENE			190					56000	

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RESULTS IN PPB	SW-1	SW-2	SW-3	SW-4	SED-1	SED-2	SED-3	SED-4	SED-5
1,4-DICHLORBENZENE	1		310		21000			84000	
1,2-DICHLOROBENZENE			11						14006
BENZOIC ACID				420					
1,2,4-TRICHLOROBENZENE			51		62000			17000	
NAPHTHALENE			24		1700				36000
2-METHYLNAPHTHALENE					960		2100		68000
PHENANTHRENE							2100		36000
FLUORENE									20000
DI-N-BUTYLPHTHALATE	2	2	8		910	1200	1200	3000	
FLUORANTHENE							2000		6900
PYRENE							2500		11000
BUTYLBENZYLPHTHALATE									53000
BIS(2-ETHYLHEXYL) PHTHALATE	10	11	82	210	4900	3100	33000	37000	2600000
DIELDRIN					170	1900	6700		
4,4'-DDT					84				1200
ARCOLOR-1248					2700	4100	4800	4200	10000
ARSENIC			87.6	132					
BARIUM			2950						468

6

AQUEOUS RESULTS IN PPB;
NON-AQUEOUS RESULTS IN PPM

	SW-1	SW-2	SW-3	SW-4	SED-1	SED-2	SED-3	SED-4	SED-5
CADMIUM			810	215			4	14.1	12
CHROMIUM			8880	23500		369		209	512
COPPER			24200	1310				895	323
LEAD			6000	1100			234	482	697
MERCURY			14.2	3.2		12			3.9
NICKEL						347		668	127
SILVER			112	55.1					
ZINC				35,500					
CYANIDE			5580					69	

7

TABLE 2

RESULTS IN PPB

	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
Chloroform								
1,2-dichloroethane								
Xylenes		52,000				78		
Trichloroethene						30		
4-methyl-2-pentanone						36		
Tetrachloroethene		250	300			13		
Toluene		18				88		
Chlorobenzene		3100		9		7	12	
Ethylbenzene		3400						13
2,4-dichlorophenol								
Naphthalene		1900			850		900	
4-chloroanaline								
2-methylnaphthalene		1900						
2,4,6-trichlorophenol								
2-nitroaniline								
Phenol							5700	

RESULTS IN PPB

	S-9	S-10	S-11	S-12	S-13	S-14	S-15
Chloroform	67						
1,2-dichloroethane	28						
Xylenes		120	490			8300	
Trichloroethene	48					120	
4-methyl-2-pentanone							
Tetrachloroethene	6200	24	69	83	120	160	
Toluene		15	96	27			
Chlorobenzene							
Ehtylbenzene			60	12		3000	
2,4-dichlorophenol							780
Naphthalene							
4-chloroanaline					600		
2-methylnaphthalene	410						
2,4,6-trichlorophenol							380
2-nitroaniline				5800			
Phenol					6500		
1,4-dichlorobenzene							

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RESULTS IN PPB

	S-9	S-10	S-11	S-12	S-13	S-14	S-15
Benzoic acid	12,000						
Dibenzofuran							
Diethylphthalate							
Phenanthrene	400			10,000	570		290
Anthracene				55			
Di-n-butylphthalate	1800			590		2800	73
Fluoranthene				13,000	1200		470
Pyrene	1700		9100	10,000	1200	5600	500
Butylbenzylphthalate	1800			590		2800	73
Fluoranthene				13,000	1200		470
Pyrene	1700		4100	10,000	1200	5600	500
Benzo(a)anthracene				5100			250
Chrysene				11,000	1500		310
Bis(2-ethylhexyl) phthalate	2.7×10^7	21,000	7400	11,000		68,000	6600
Di-n-octylphthalate						10,000	
Benzo(b)fluranthene				7700	1800		250
Benzo(k)fluoranthene				6600	1400		200
Benzo(a)pyrene				5000	1100		200

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RESULTS IN PPB

	S-9	S-10	S-11	S-12	S-13	S-14	S-15
Indeno(1,2,3-cd)pyrene				3300	1100		140
Dibenz(a,h)anthracene							
Benzo(g,h,i)perylene				4100	1500		170
Aldrin							
Dieldrin							15
4,4'-DDD							
Aroclor-1248		1000	65,000	21,000	89,000	17,000	220

RESULTS IN PPM

	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10
Antimony	13.3					23.3	37	13		
Arsenic			25.5	23	31		23.5			
Barium		427	459		529					
Cadmium		3.1	3.1		5.2	15.1	6.6	5.5		
Chromium			395			502	371	158		
Copper			174			1050	283	193	235	
Lead	598	1210	1270	720	594	4090	673	537	242	149
Mercury	1.2					3.4	3.4	9.6		
Nickel			697			398	428	220		
Silver						25.4				
Vanadium			108			388	205			
Zinc		635	554	484	538	1790	1106	1010	79	
Cyanide						131				

RESULTS IN PPM 7

	S-11	S-12	S-13	S-14
Antimony		27.7	145	27.1
Arsenic		23.5	20.3	78.1
Barium			560	554
Cadmium	9.3	11.4	5.2	5.1
Chromium		1890	5360	797
Copper		269	234	342
Lead	6820	2710	1320	2360
Mercury	9.9		1.8	5.9
Nickel	101	136		
Vanadium		144		
Zinc	1320	1680	1120	1170

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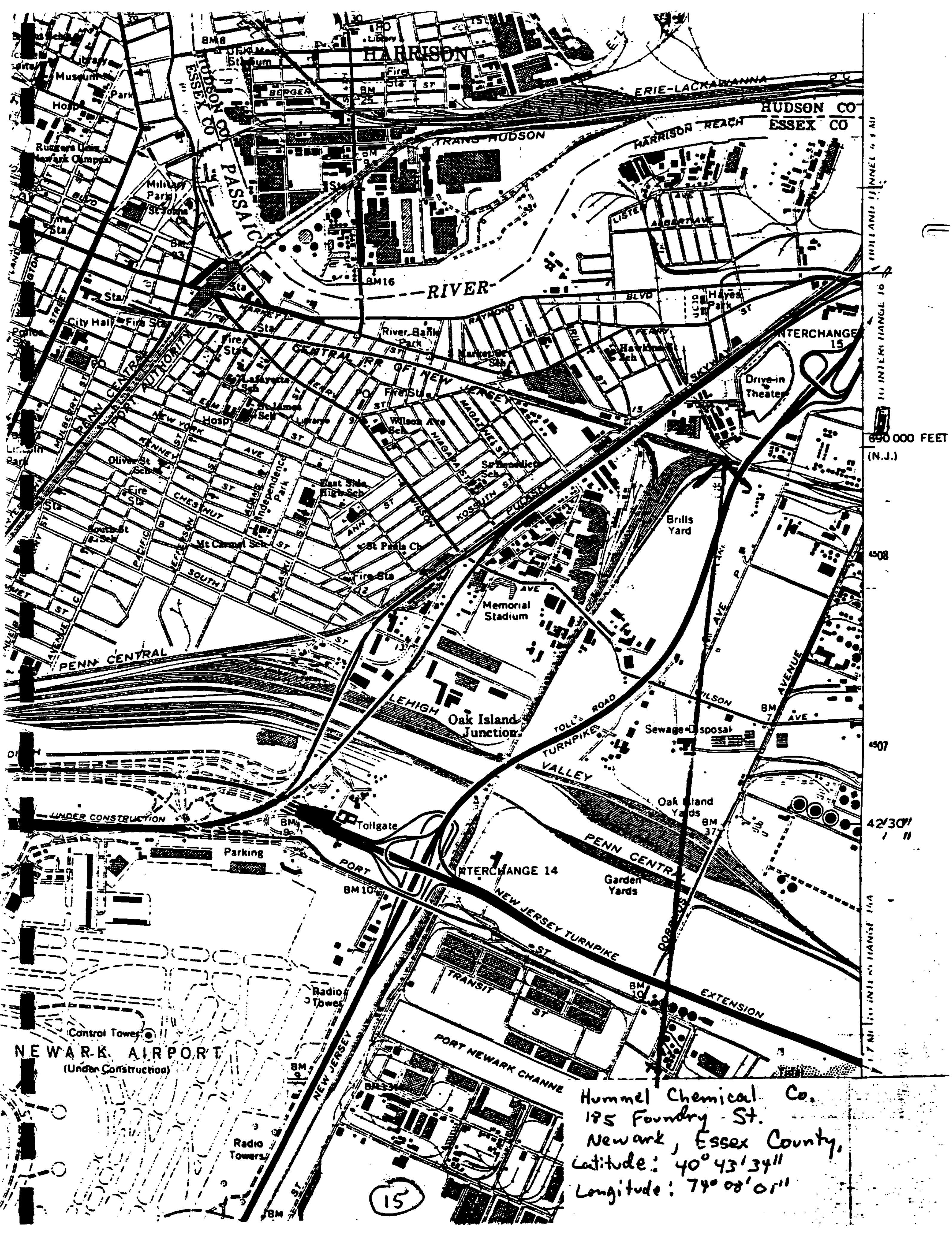
HUMMEL CHEMICAL
185 FOUNDRY STREET
NEWARK, ESSEX COUNTY
EPA ID # NJD002174712

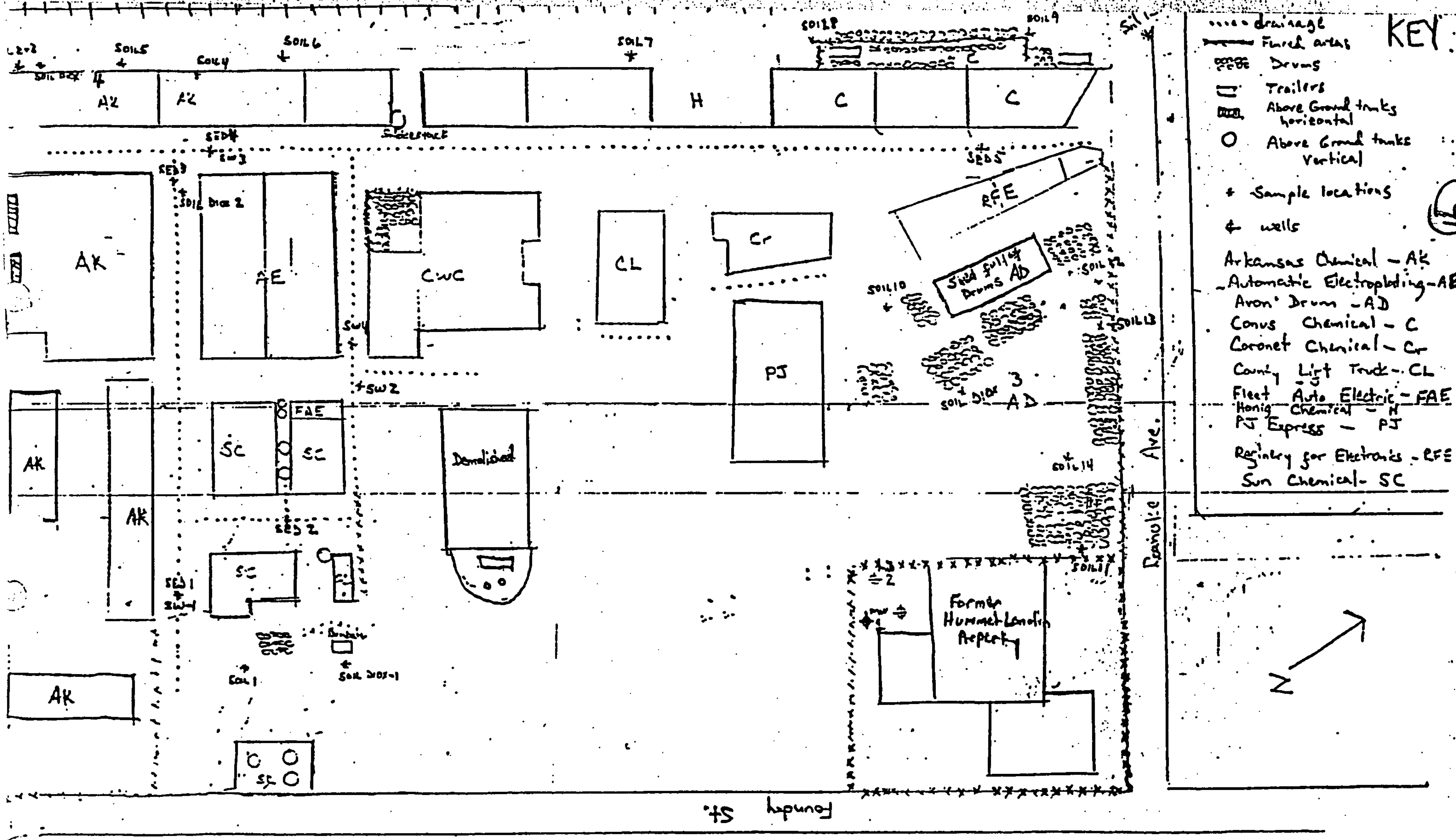
TABLE OF CONTENTS



Hummel Chemical Co.
185 Foundry St.
Newark, Essex County,
Latitude: 40° 43' 34"
Longitude: 74° 08' 01"

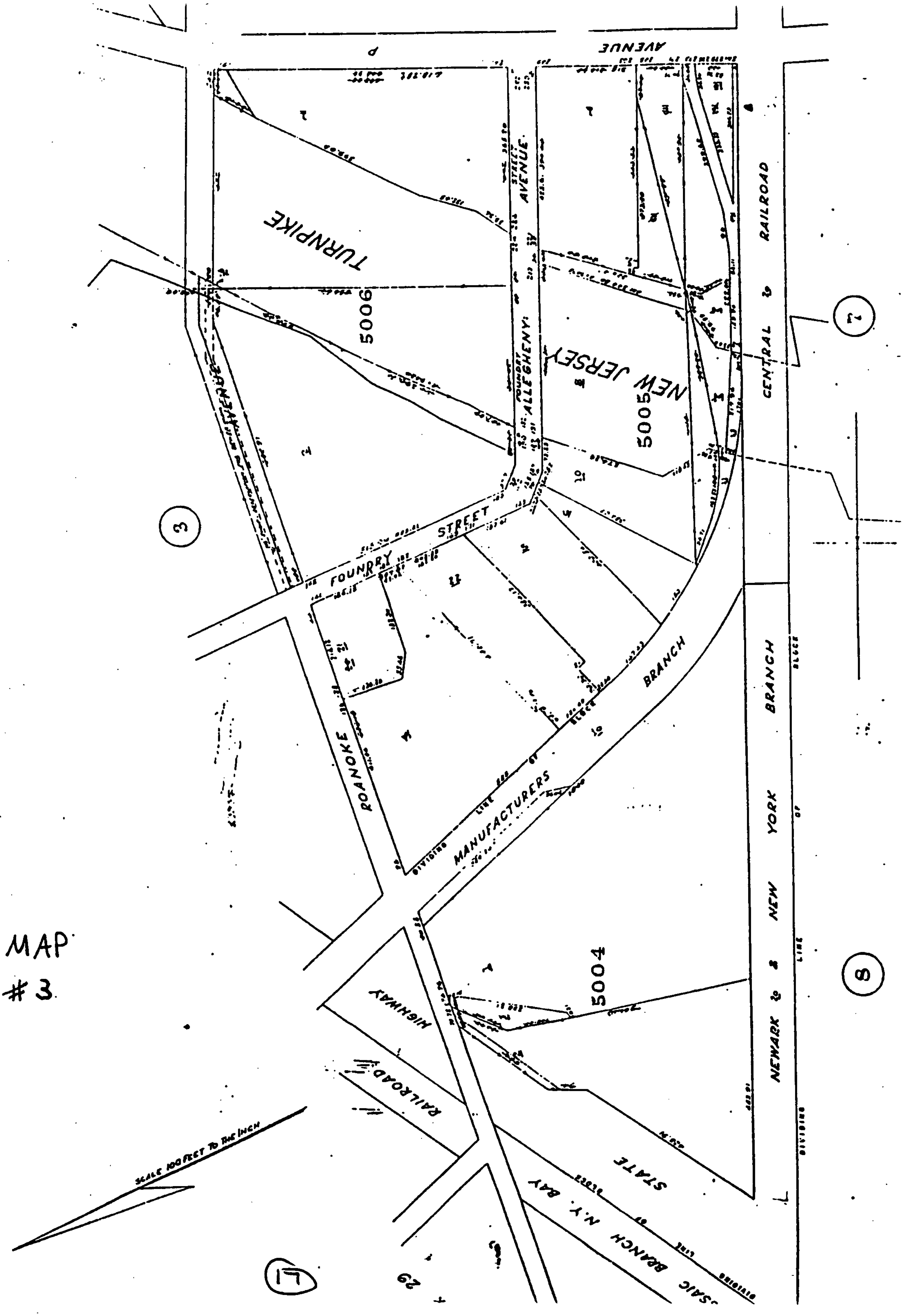
(15)

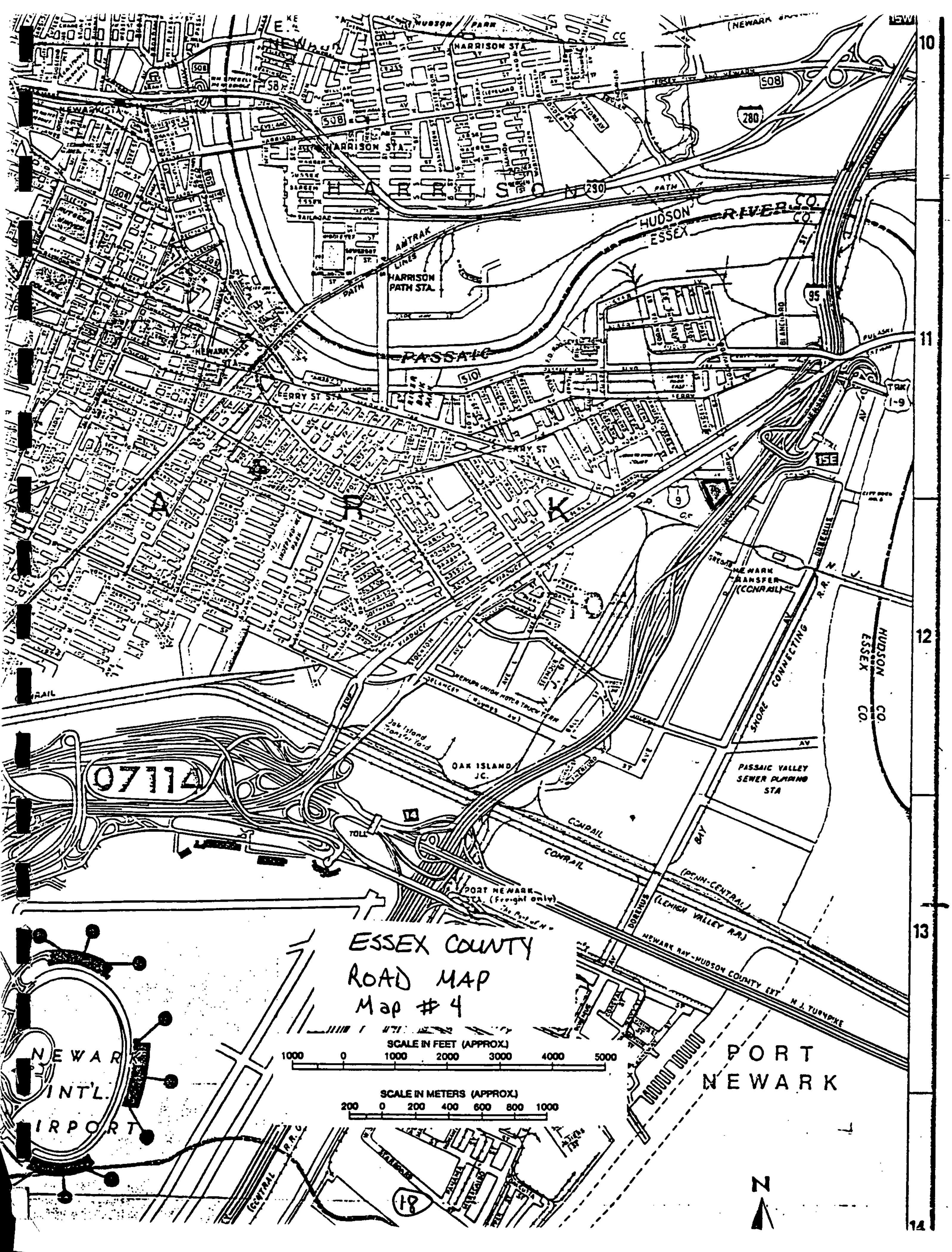
SITE MAP
Map # 2



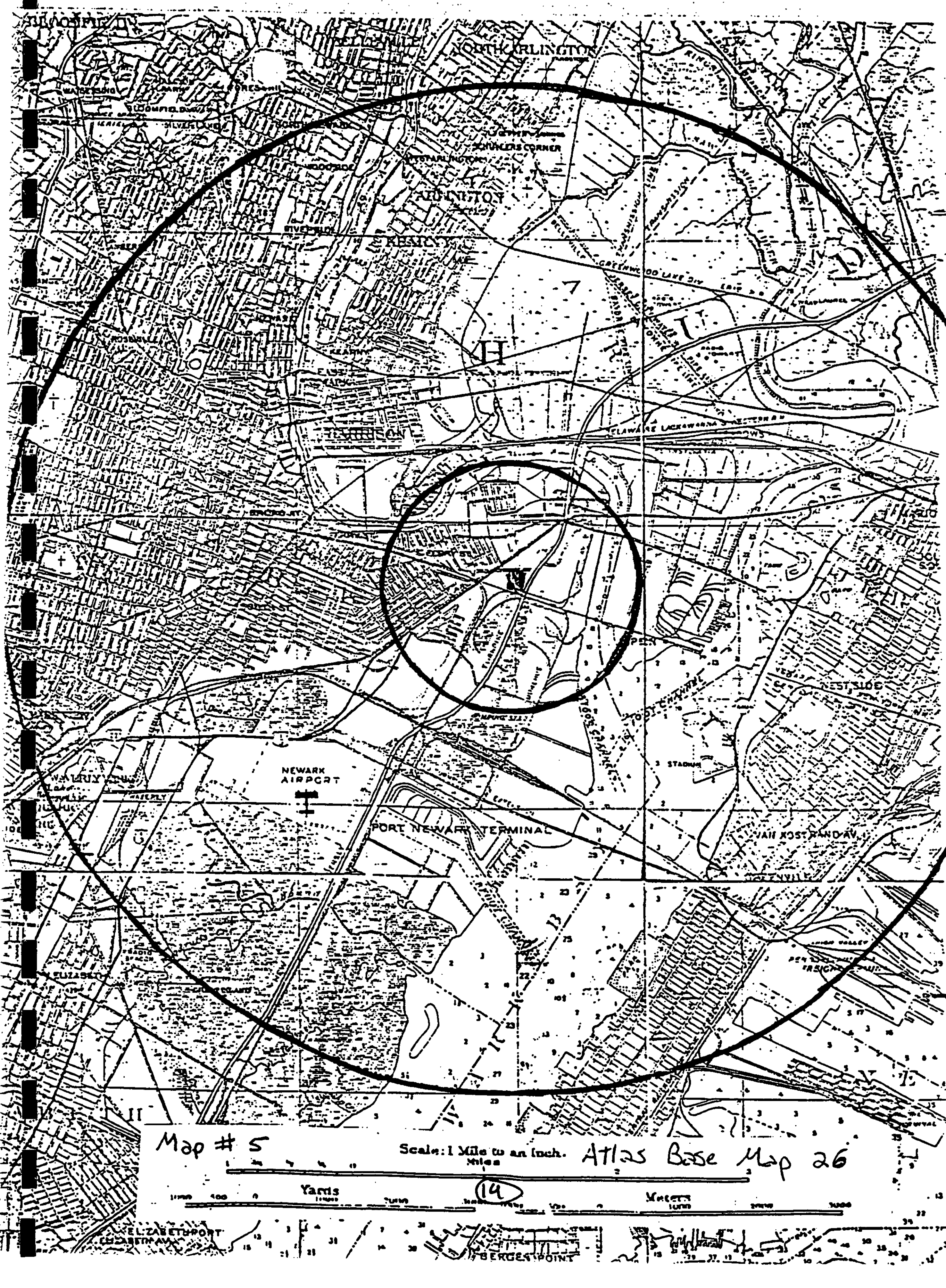
Hummel Chemical (AKA: 185 Foundry St. Site) 10/17/88 Not to Scale

TAX MAP
Map #3


AVENUE
TURNPIKE
5006
ALLEGHENY AVENUE
NEW JERSEY
5005
CENTRAL RAILROAD
FOUNDRY STREET
ROANOKE
MANUFACTURERS BRANCH
NEWARK & NEW YORK BRANCH
5004
HIGHWAY
RAILROAD
STATE
N.Y. BAY
SCALE 100 FEET TO THE INCH
3
8
17



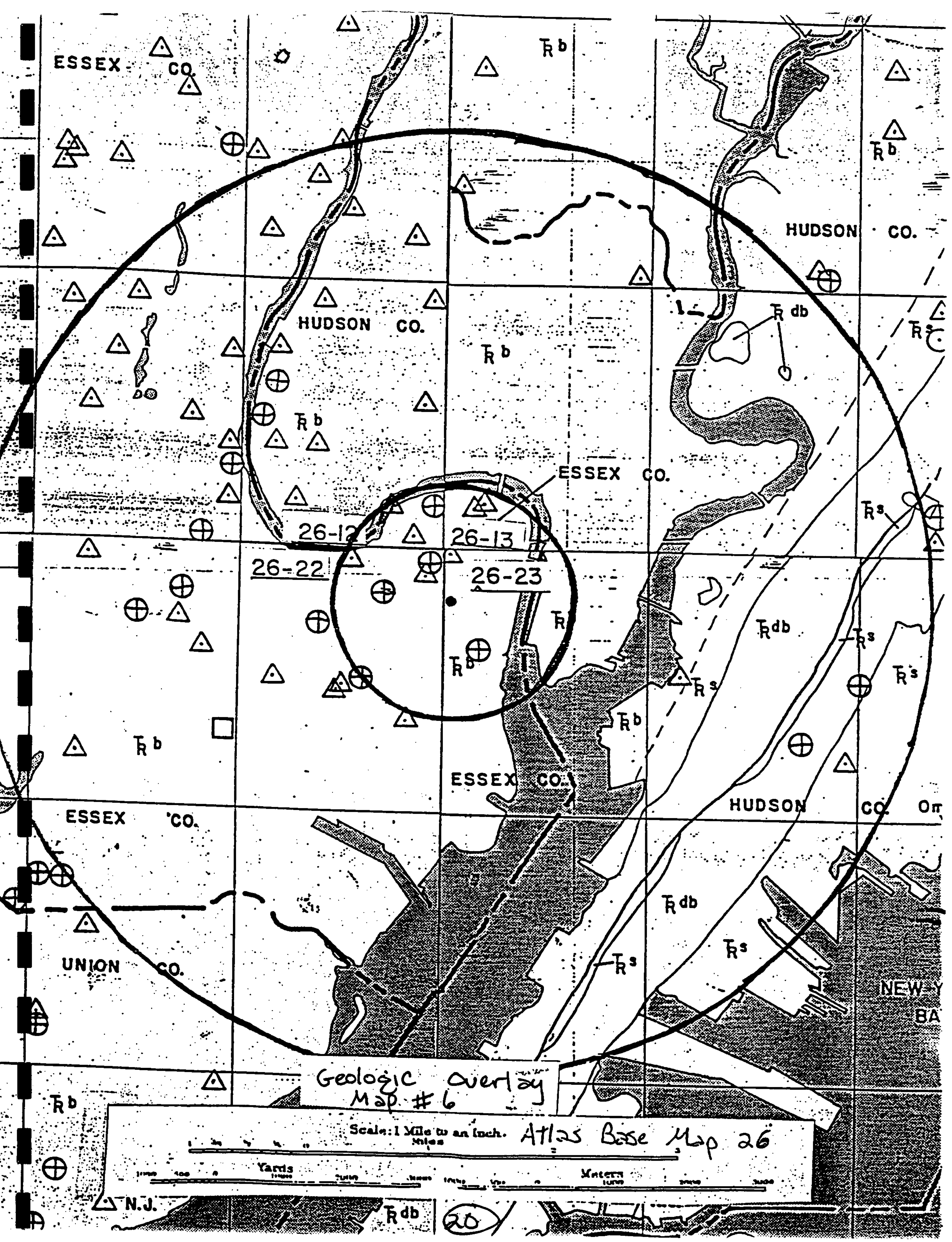
ESSEX COUNTY
ROAD MAP
Map # 4
SCALE IN FEET (APPROX.)
1000 0 1000 2000 3000 4000 5000
SCALE IN METERS (APPROX.)
200 0 200 400 600 800 1000
HARRISON
HARRISON STA.
HARRISON PATH STA.
NEWARK STA.
PASSAIC
HUDSON RIVER CO.
ESSEX CO.
AMTRAK
PATH
CONRAIL
PULASKI
FERRY ST
NEWARK TRANSFER (CONRAIL)
OAK ISLAND JC.
PASSAIC VALLEY SEWER PUMPING STA
SHORE CONNECTING
DOREMUS AV
PORT NEWARK STA. (Freight only)
(PENN-CENTRAL)
(LEHIGH VALLEY R.R.)
NEWARK BAY-HUDSON COUNTY EXT
N.J. TURNPIKE
PORT NEWARK
NEWARK INT'L. AIRPORT
07114
ESSEX CO.
HUDSON CO.
508
280
95
1-9
15E
510
14
18
N
10
11
12
13
14



Map # 5

Atlas Base Map 26

(14)


ESSEX CO.
HUDSON CO.
HUDSON CO.
ESSEX CO.
26-12
26-13
26-22
26-23
ESSEX CO.
HUDSON CO.
ESSEX CO.
UNION CO.
N.J.
TRb
TRdb
TRs
Geologic Overlay Map #6
Scale: 1 Mile to an Inch.
Miles
Yards
Meters
Atlas Base Map 26

LEGEND FOR ATLAS SHEET 26 (GEOLOGY)

△ — INDUSTRIAL WELL YIELD OVER 70 GALLONS PER MINUTE (INCLUDING PRIVATE WELLS)

□ — PUBLIC SUPPLY WELL YIELDING OVER 70 GALLONS PER MINUTE

⊕ — UNSUCCESSFUL ROCK WELL YIELDING LESS THAN 70 GALLONS PER MINUTE

⊙ — UNSUCCESSFUL SAND WELL YIELDING LESS THAN 70 GALLONS PER MINUTE

⊞ — NO TEST – NO DATA ON YIELD

FAULT (DASHED WHERE INFERRED)

CONTACT (DASHED WHERE INFERRED)

PHYSIOGRAPHIC PROVINCE BOUNDARY

WATER SUPPLY TRANSMISSION LINE

NOTE: WHERE THE PRECAMBRIAN FORMATION BOUNDARIES TERMINATE ABRUPTLY, IT IS THE GEOLOGIST'S OPINION THAT THE GEOLOGICAL COMPLEXITY OF THE AREA PREVENTS FURTHER INTERPRETATIONS.

Kmr — CRETACEOUS MAGOTHY AND RARITAN FORMATIONS (SAND AND CLAY)

TRb — TRIASSIC BRUNSWICK FORMATION

TRc — TRIASSIC CONGLOMERATE BEDS OF THE STOCKTON FORMATION

TRl — TRIASSIC LOCKATONG FORMATION

TRdb — TRIASSIC DIABASE

TRbs — TRIASSIC BASALT FLOWS

Sd — SILURIAN DECKER LIMESTONE AND LONGWOOD SHALE FORMATIONS

Sgp — SILURIAN GREEN POND CONGLOMERATE

Omb — ORDOVICIAN MARTINSBURG SHALE

ꞒOk — CAMBRO ORDOVICIAN KITTATINNY LIMESTONE

Ꞓh — CAMBRIAN HARDYSTON SANDSTONE

PRECAMBRIAN:

gh – HORNBLENDE GRANITE WITH PYROXENE GRANITE

ga – ALASKITE

am – AMPHIBOLITE

px – PYROXENE GNEISS

gnq – QUARTZ PLAGIOCLASE GNEISS

gnb – BIOTITE GNEISS

sk – SKARN, GRAPHITE SCHIST

fnd — FORMATION NOT DETERMINED

BLOCK #26-12

8/76

A. Elizabeth, Orange

B. Arthur Kill-Elizabeth, Rahway; Hackensack-Hackensack; Passaic-Lower Passaic

C. 2.

Map No.	Location	Period of Record
63	Second River at Brighton Ave., East Orange	7/23/38
64	Second River at Bloomfield Ave., Bloomfield	7/23/38
65	Second River at Belleville	1937-1961
66	Second River at Newark Pipe, Belleville	7/23/38
67	Elizabeth River at Irvington	1931-1938

3. 262 Passaic River at Harrison 1967-1971

Water Quality Standards: (explained in Atlas Sheet description)
FW3, TW2 except where classified TW3

D. Brunswick Formation (Trb), Basalt Flows (Trbs)

E. 1. Physiographic Province: Piedmont
Subdivision: Triassic Lowlands
Major Topographic Features: Red Sandstone Plain, Watchung Ridges
Elevations (ft.above sea level): ridges 650, valleys 0
Relief (ft.): 650

2. a. Normal Year: 45"
Dry Year: 37"
Wet Year: 55"

b. January: 31°F
July: 74°F

c. 243 days. Last killing frost: 4/15; first killing frost: 10/20

F. Bergen County:
Riverside County Park and Hackensack River Area
Essex County:
Eagle Rock Reservation
Branch Brook Park

H. Montclair Railroad Terminal, Montclair
Israel Crane House, Montclair
Sydenham House, Newark
Kruegar Mansion, Newark
Penn Station, Newark
First Baptist Peddie Memorial Church, Newark
Saint James A.M.E., Newark
Saint Stephan's Church, Newark
Saint James's Church, Newark
Saint Mary's Church, Newark
Saint Barnabas, Newark
Saint Columba's Church, Newark
Saint John's Church, Newark
Saint Patricks Procathedral, Newark
Queen of Angels Church, Newark

H. (contd.)

Cathedral Evangelica Reformada, Newark
New Point Baptist Church, Newark
South Park Presbyterian Church, Newark
Pan American C.M.A. Church, Newark
First United Methodist Church, Newark
House of Prayer Episcopal Church and Rectory, Newark
Grace Church, Newark
North Reformed Church, Newark
The Old First Presbyterian Church, Newark
Trinity Episcopal Church, Newark

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
26-12-157	Hahne & Co.			505	240	Trb
26-12-164	Quadrel, Michael	1955	18	151	75	"
26-12-194	Town of Montclair	1966	21/41	300	950	"
26-12-194	Montclair Water Bureau	1966	16/36	300	470	"
26-12-218	Glen Ridge Country Club	1967	40	300	200	"
26-12-222	Bloomfield Savings Bank	1956		145	100	"
26-12-313	Hoffman-LaRoche			902	128	"
26-12-327	Food Fair Stores, Inc.			209	70	"
26-12-334	Kingsland's Paper Mills			400	125	"
26-12-335	Wiggins Plastics, Inc.	1963	24'-3/12"	378	180	"
26-12-338	Federal Telecommunications Lab	1958	39'6"	500	114	"
26-12-386	Liquid Carbonic Corp.			518	100	"
26-12-389	National Yeast Corp.			512	126	Trbs
26-12-394	Federal Leather Co.			802	60	Trb
26-12-417	Schering Corp.			478	127	"
26-12-423	Kidde W. & Co.			400	400	"
26-12-448	Orange Dairy Co.			250	75	"
26-12-449	City of Orange	1970	61'5"	500	524	"
26-12-478	"	1971	56	506	500	"
26-12-486	Colonial Life Ins. Co.			357	323	"
26-12-513	Leonora Corp.	1957	33	200	70	"
26-12-526	Eastern Tool & Mfg.Co.			550	126	"
26-12-537	National Grain & Yeast Corp.			457	125	"
26-12-545	MGM Records (Div.of Loews)	1959	23	211	115	"
26-12-545	"	1960	36	579	120	"
26-12-547	"			400	275	"
26-12-557	Warner Mfg. Co.			395	220	"
26-12-566	Tiffany & Co.			800	50	"
26-12-577	Bloomfield Moulding Co.	1968	18	350	200	"
26-12-622	Mansol Ceramics Co.			250	100	"
26-12-644	Droll Molding Co., Inc.	1962	50	300	80	"
26-12-655	Summit Chemical Prod.Corp.			414	150	"
26-12-657	Crowhurst, A.J. & Sons			83	325	Q
26-12-675	Aluminum Finishing Co.			150	100	Trb
26-12-682	North Newark Ice Co.			250	123	"
26-12-695	V.H. Swenson Co.	1962	49	40	170	"

26-12-723	Mountain Ice Co.			634	300	Trb
26-12-729	Vinton Apartments Inc.	1955	52	255	160	"
26-12-747	Columbia Theaters, Inc.	1953	26	312	140	"
26-12-751	Woolworth & Co.	1965	76'10"	300	80	"
26-12-758	Food Fair Stores	1956	73	214	180	"
26-12-783	Pabst Brewing Co.			535	300	"
26-12-812	Ward Baking Co.			200	111	"
26-12-822	Crabb, W. & Co.			600	300	"
26-12-827	Trent Hat Corp.			200	150	"
26-12-839	Reid Ice Cream Co.			600	100	"
26-12-846	Fagin Brothers Coal Yard			150	100	"
26-12-864	Barton Realty Co., Inc.	1965		385	100	"
26-12-869	Alderney Dairy Co.			450	113	"
26-12-893	Ballantine & Son Ale			1200	0	"
26-12-896	Mutual Benefit Life Ins.Co.	1965	44'8"	312	219	"
26-12-898	Prudential Life Ins. Co.			1225	15	"
26-12-918	Abbey Record Co.	1962	24	697	135	"
26-12-921	Two Guys from Harrison	1959	99	405	628	"
26-12-933	DuPont			202	148	"
26-12-942	N.J. Rolling Mills	1963	99	400	20	"
26-12-944	Harrison Supply Co.	1966	88	174	50	"
26-12-948	Mountain Ice & Fuel Co.			350	122	"
26-12-957	Doelger Brewery			400	175	"
26-12-966	Verzelano, N.	1959	146	235	150	"
26-12-976	Driver-Harris Co.	1946	241	337	600	Q
26-12-994	Acme Refining Co.	1960	144	500	150	Trb
26-12-996	Lister Brothers			1200	0	"
26-12-998	Stanley Tools			637	125	"

1 mile

J. Geodetic Control Survey monuments described
Index Maps 21,26; adjacent Index Maps 20,25

BLOCK #26-13

A. Jersey City, Orange, Weehawken

B. Hudson-Hudson; Hackensack-Hackensack; Passaic-Lower Passaic

C. 3.

Map No.	Location	Period of Record
242	Berry's Creek at Moonachie, Moonachie Ave.	1964-
263	Hackensack River at Harrison, Belleville Tpk.	1967-

Water Quality Standards: (explained in Atlas Sheet description)
TW2 except where classified TW3

D. Brunswick Formation (Trb), Stockton Formation (Trs), Diabase (Trdb), Manhattan Schist (Oms)

E. 1. Physiographic Province: Piedmont
Subdivision: Triassic Lowlands
Major Topographic Features: Red Sandstone Plain, Palisades Ridge, Hackensack Meadows
Elevations (ft.above sea level): ridges 250, valleys 0
Relief (ft.): 250

2. a. Normal Year: 43"
Dry Year: 36"
Wet Year: 53"

b. January: 32°F
July: 74°F

c. 245 days. Last killing frost: 4/10; first killing frost: 10/20

F. Bergen County:
Riverside County Park and Hackensack River Area

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
26-13-157	Pennick, S.B. Co.	1966	42	352	180/200	Trb
26-13-177	Breyer Ice Cream Co.			702	200	"
26-13-195	Omni Chemical Corp.	1968	39	300	157	"
26-13-195	Sika Chemical Corp.	1966	25	302	220	"
26-13-214	Trubeck Laboratories	1956	191	201	105	Q
26-13-215	Beckton & Dickinson	1966	118	363	251	Trb
26-13-216	Marijon Piece Dye Co.	1965	45	285	135	"
26-13-226	Hackensack Water Co.	1954	92'11"	103	No test	Q
26-13-234	U.S. Printing Ink Co.	1965	70	220	60	Trb
26-13-268	Top Notch Plating Co.	1965	21	300	190	"
26-13-298	Alpha Refining Co.			400	115	"
26-13-415	Minit-Man Auto Car Wash	1957	39	180	90	"
✓26-13-447	Food Fair Stores, Inc.	1956	30	320	82	"
✓26-13-499	Pfaff Tool & Mfg. Co.	1963	66.5	740	145	"

26-13-598	Erie Railroad			184	200	Trs
26-13-598	"			182	4	Trb
26-13-615	Keystone Metal Finishers	1968	20	200	312	"
26-13-642	"	1950	18	200	76	"
26-13-655/6	"	1960	21	150	150	Trs
26-13-668	Kiesewetter			380	0	Trdb-Trs
26-13-695	North Bergen Realty Co.			72	90	Q
mile ✓26-13-775	Fairmount Chemical Co.	1965	114	300	300	Trb
✓26-13-775	United Shellac Co.			475	200	"
26-13-921	Miller & Co.			135	925	Q
26-13-924	DeAngelis Packing Co.	1948		45	0	"
26-13-983	Mehl, John & Co.	1913		1020	150	Trdb
26-13-983	"	1923		1050	40	"
26-13-984	Mountain Ice Co.			950	0	Trdb-PG
26-13-987	Steel Laundry Co.			1028	130	" "
26-13-994	General Refrigerator			1350	0	Trs-PG
26-13-995	Columbia Amusement Park			200	100	Trs

J. Geodetic Control Survey monuments described
Index Maps 21,26; adjacent Index Map 16

BLOCK #26-22

A. Elizabeth

B. Arthur Kill-Elizabeth, Elizabeth Channel, Morses Creek; Passaic-Lower Passaic

C. 1. Newark WSO AP - Detailed meteorologic data

2.

Map No.	Location	Period of Record
67	Elizabeth River at Irvington	1931-1938
68	Elizabeth River at Nye Ave., Irvington	7/23/38
72	Elizabeth River at Elizabeth	1921-

3.

262	Passaic River at Harrison	1967-1971
272	Elizabeth River at Morris Ave., Elizabeth	1964-

Water Quality Standards: (explained in Atlas Sheet description)
FW3, TW2 except where classified TW3

D. Brunswick Formation (Trb), Stockton Formation (Trs), Diabase (Trdb)

E. 1. Physiographic Province: Piedmont
Subdivision: Triassic Lowlands
Major Topographic Features: Wisconsin Terminal Moraine, Red Sandstone Plain, Hackensack Meadows, Newark Bay, Palisades Ridge
Elevations (ft.above sea level): ridges 300, valleys 0
Relief (ft.): 200

2. a. Normal Year: 44"
Dry Year: 36"
Wet Year: 53"

b. January: 32°F
July: 74°F

c. 243 days. Last killing frost: 4/15; first killing frost 10/20

F. Essex County:
Weequahic Park
Union County:
Elizabeth River Park
Warinanco Park

H. Boxwood Hall/Boudinot Mansion, Elizabeth (State Owened)

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
26-22-143	Irvington Smelting & Ref.Wks.	1953	71	209	192	Trb
26-22-143	"	1953	62'4"	304	300	"
26-22-145	Associated Mech.Devices	1960	83	250	80	"
26-22-149	Gallo Asphalt Co.	1961	107	201	200	"
✓26-22-213	Krueger Brewing Co.			656	435	"
✓26-22-228	Smith & Smith Funeral Parlor			776	25	"
✓26-22-234	U.S. Navy			565	39	"
✓26-22-237	Conmar Corp.			300	450	"
✓26-22-262	National Lock Washer Co.			800	100	"
<1 mile ✓26-22-275	Linde Air Products Co.	1954	44'5"	500	124	"
✓26-22-293	New York Port Authority	1968	60	370	260	"
— ✓26-22-322	Standard Bitulithic Co.	1964	89'11"	406	360	"
✓26-22-327	Pfeiffer, H.			505	12	"
— ✓26-22-333	Arkansas Co., Inc.	1965	72'9"	400	65	"
— ✓26-22-333	Ronson Metals Corp.	1965	80	300	220	"
— ✓26-22-334	Wilson, H.A. Co.			778	8	"
✓26-22-345	Chem-Fleur	1965	97	306	200	"
✓26-22-355	Englehard Ind., Inc.	1966	54/79'8"	428	167	"
✓26-22-355	"	1965	80'7"	400	401	"
✓26-22-356	"	1966	78.5/92	495	4	"
✓26-22-368	Rutherford & Delaney Hldg.Co.	1956	42	220	100	"
26-22-411	Bristol Meyers	1967	49	500	159	"
26-22-418	Dillon-Beck Mfg. Co.			379	100	"
26-22-449	Elizabethtown Water Co.			400	550	"
26-22-463	Orbis Products Corp.	1958	157	350	12	"
26-22-517	Pennick, S.B. Co.	1961	64'10"	585	24	"
26-22-518	Pure Carbonic			600	30	"
26-22-546	Black Diamond Grit Co.	1960	92	265	150	"
26-22-574	Londat Aetz Fabric Co.	1965	50	600	30	"
26-22-574	Elizabeth Abbatoir			641	75	"
26-22-744	Morey LaRue Laundry			700	15	"
26-22-745	"			600	14	"
26-22-785	Stevenson Car Co.			300	95	"
26-22-786	Feldman Brothers			805	54	"
26-22-795	Reichold Chemical Co.	1967	39'6"	400	415	"
26-22-828	Singer Mfg. Co.			1200	90	"
26-22-833	General Chemical Co.	1965	106	500	70	"
26-22-842	Clauss Bottling Works			500	50	"
26-22-847	Elizabethtown Gas & Light			300	0	"
26-22-852	Riker Motor Co.			500	0	"
26-22-854	Thomas & Betts Co., Inc.			500	264	"

J. Geodetic Control Survey monuments described
Index Map 26; adjacent Index Map 31

BLOCK #26-23,24

A. Elizabeth, Jersey City

B. Arthur Kill-Elizabeth Channel, Passaic-Upper Passaic

C. 1. Jersey City - Non-recording temperature and precipitation gauges

Water Quality Standards: (explained in Atlas Sheet description)
TW2 except where classified TW3

D. Brunswick Formation (Trb), Stockton Formation (Trs), Diabase (Trdb), Manhattan Schist (Oms), serpentine (sp)

E. 1. Physiographic Province: Piedmont
Subdivision: Triassic Lowlands
Major Topographic Features: Red Sandstone Plain, Palisades Ridge, Hackensack Meadows, Newark Bay, New York Bay
Relief: 10'

2. a. Normal Year: 43"
Dry Year: 35"
Wet Year: 49"
b. January: 32°F
July: 74°F
c. 245 days. Last killing frost: 4/10; first killing frost: 10/20

F. Hudson County:
Lincoln Park
Div. of Parks and Forestry:
Liberty State Park
Little Basin Area

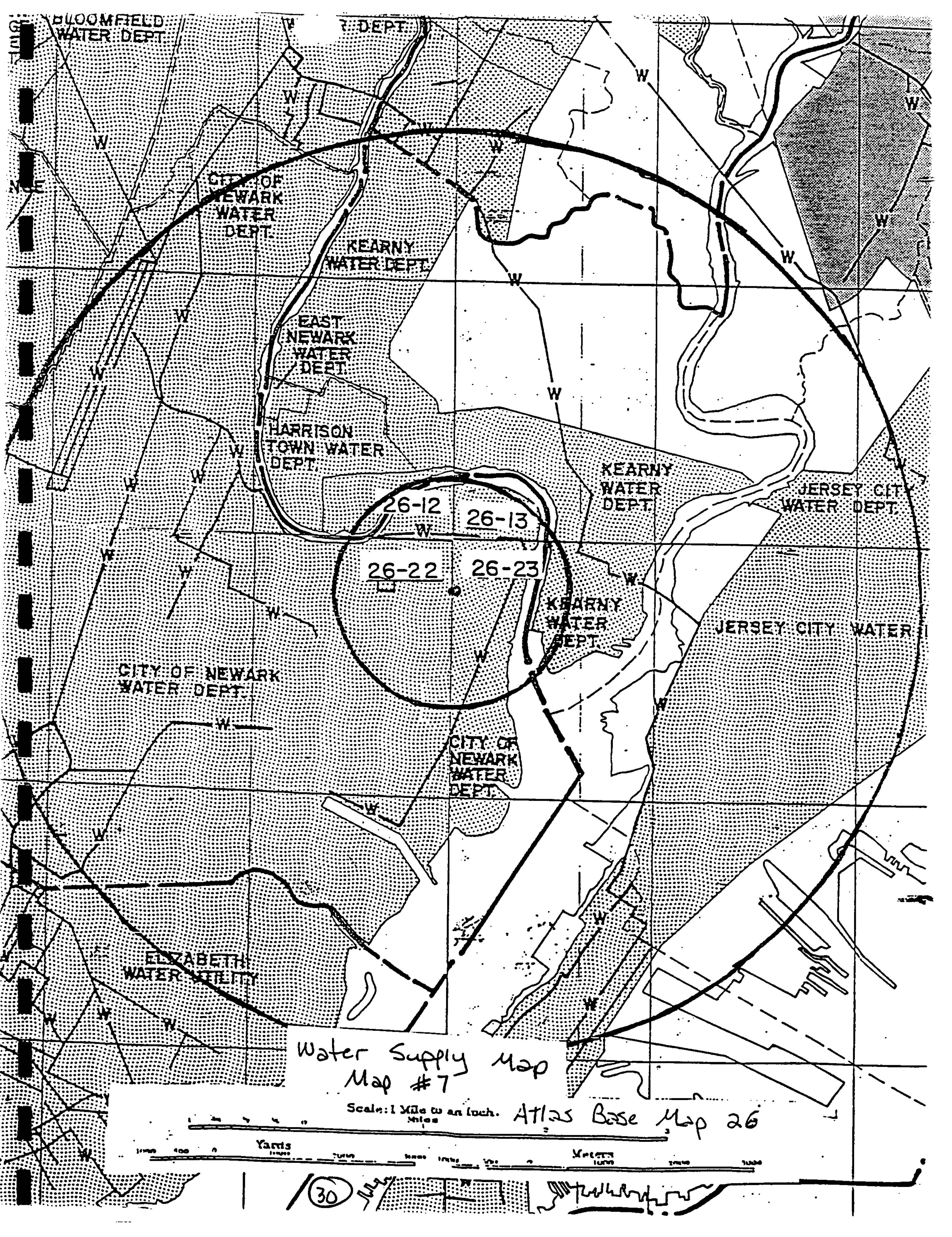
G. U.S. National Park Service:
Statue of Liberty National Monument (Ellis Island)
U.S. Army:
Military Ocean Terminal

H. Statue of Liberty National Monument
Hudson County Courthouse, Jersey City

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
26-23-111	Pfaff & Kendall	1965	81.5	200	100	Trb
26-23-142	Lincoln Farm Prod.Co.			109	25	Trbs
26-23-245	Spalding & Jennings			422	75	Trb-PG
26-23-291	Berkeley Industries	1956	115/140	335	60	Trbd
26-23-293/6	Snead & Co.			300	60	Q
26-23-333	Erie Railroad			197	157	Oms
26-23-334	Lembeck & Betz's Brewery			1000	33	Trs
26-23-344	Burnett Ave. (228) Co.			438	55	"
26-23-763	Esso Standard Oil Co.	1959	114/252	505	3	"

J. Geodetic Control Survey monuments described
Index Map 26; adjacent Index Maps 31,21,16



Water Supply Map
Map #7

Atlas Base Map 26

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LEGEND

WATER SUPPLY		AREA SERVED BY PRIVATE WATER SERVICE COMPANIES
		AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES
		AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES
		AREA NOT PRESENTLY SERVED BY WATER SERVICE
		PUBLIC SUPPLY WELLS
		WATER MAIN ACROSS HIGHWAY FOR FUTURE USE
		SURFACE WATER INTAKE
	W	MAJOR WATER MAINS
SEWAGE, LANDFILL		AREA SERVED BY PUBLIC SEWAGE SERVICE
		AREA NOT PRESENTLY SERVED BY SEWAGE SERVICE
		SANITARY LANDFILLS
		SEWAGE TREATMENT PLANTS (CAPACITY <0.3mgd)
		SEWAGE TREATMENT PLANTS (CAPACITY ≥0.3mgd)
	S	MAJOR SEWAGE TRANSMISSION LINES
DRAINAGE BASIN		DRAINAGE BASIN BOUNDARY
		RIVER BASIN BOUNDARY
	HUDSON	DRAINAGE BASIN NAME
		STREAMS AND RIVERS
		FLOOD PRONE AREAS
POPULATION		COUNTY BOUNDARY
		MUNICIPAL BOUNDARY
	( )	POPULATION DENSITY IN PERSONS PER SQUARE MILE
	[ ]	AREA IN SQUARE MILES
	%	PERCENT AREA OF MUNICIPALITY ON BLOCK
		MARKET ROADS
		BUILT UP AREAS
		STATE BOUNDARY

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SUBJECT TO REVISION

Map # 8

WATER WITHDRAWAL POINTS AND NJGS CASE INDEX SITES WITHIN 5.0 MILES OF:

LATITUDE 404305
LONGITUDE 740840

DRAFT

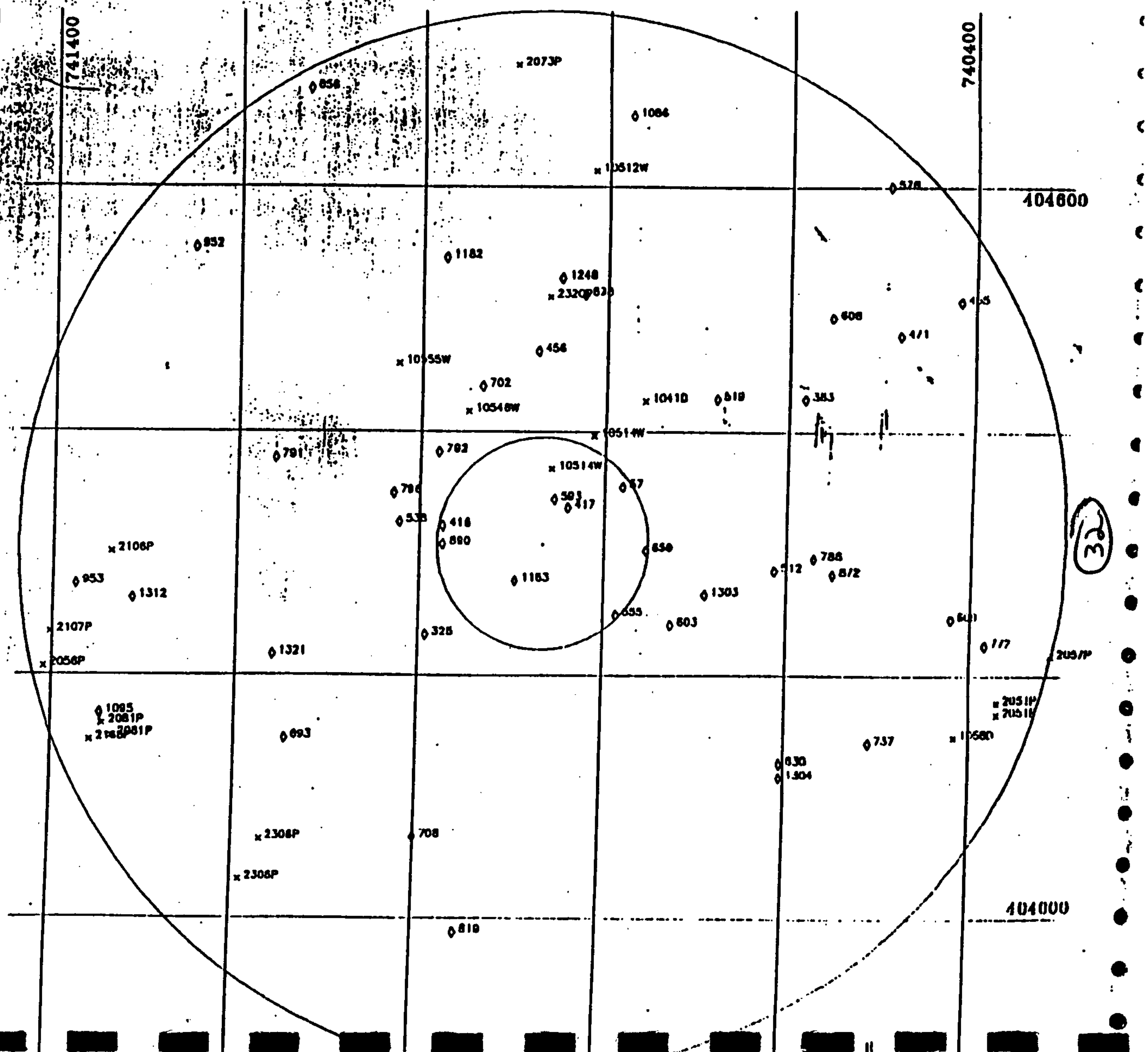
SCALE: 1:63,360
(1 Inch = 1 Mile)

x WATER WITHDRAWAL POINTS
◊ NJGS CASE INDEX SITES
1 MILE AND 5 MILE RADII INDICATED

NJGS CASE INDEX DATA RETRIEVED FROM:
NEW JERSEY GEOLOGICAL SURVEY
ON 12/22/87

PLOT PRODUCED BY:
NJDEP
DIVISION OF WATER RESOURCES
BUREAU OF WATER ALLOCATION
CN-029
TRENTON, NJ 08625

DATE: 04/25/88



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Page 1 of NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 404305 LAT. 740840 LON. AS OF 12/22/87 (IN ORDER BY DECREASING LONGITUDE) - 01/[illegible]

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	PRCODE1	PRCODE2	STATUS1	STATUS2
953	COX RESIDENCE, MONTCLAIR, ESSEX CO.	404245	741345	4.5	0	0140	3070	1	C
1095	ARROW ENGINEERING, HILLSIDE, UNION CO.	404141	741328	4.5	53	0000	0	1	A
1312	NUDER CHEMICAL, IRVINGTON, ESSEX CO.	404238	741308	3.9	00	0140	3070	1	C
952	ORANGE WATER DEPT., ORANGE, ESSEX CO.	404530	741230	4.4	00	0130	3070	1	C
791	GENERAL ELECTRIC CO-NEWARK LAMP PLANT	404347	741135	2.7	00	0103	3070	1	B
1321	J.F.HENRY CHEMICAL CO., NEWARK, ESSEX CO.	404210	741135	2.8	63	0110	3070	1	B
693	J.T. BAKER, PHILLIPSBURG, WARREN CO.	404129	741126	3.0	00	130	0010	1	A
656	COOPER IND (FORM.MCGRAW EDISON), BELLEVILLE, ESSEX CO.	404648	741115	4.8	00	3070	130	1	C
796	J & R METALLIZING CO., INC., NEWARK, ESSEX CO.	404330	741017	1.5	00	0110	3070	1	B
538	J.L. ARMITAGE + CO., NEWARK, ESSEX CO.	404316	741013	1.4	0	130	3070	1	
708	KAPKOWSKI RD. LANDFILL, ELIZABETH, UNION CO.	404040	741000	3.0	50	100	3070	0	
325	FRONTAGE ROAD DRUM DUMP, NEWARK, ESSEX CO.	404220	740955	1.4	1	0130	0	1	B
792	GEORGIA-PACIFIC CORP—CASTING OPER, NEWARK, ESSEX CO.	404330	740948	1.3	00	0110	3070	1	B
793	GEORGIA-PACIFIC CORP—POLYMER MATE, NEWARK, ESSEX CO.	404330	740948	1.3	00	0110	3070	1	B
416	ALBERT STEEL DRUM/PRENTISS DRUG, NEWARK, ESSEX CO. (DIOXIN)	404314	740945	1.0	72	103	130	1	C
870	CHEM-FLEUR, NEWARK, ESSEX CO.	404305	740945	0.9	00	0110		1	B
1182	FRANKLIN PLASTICS, KEARNY, HUDSON CO.	404525	740945	2.8	34	0100	3070	1	A
819	NUODEX, INC - ELIZABETH PLANT, UNION CO.	403953	740932	3.8	00	0103	0100	1	B
702	HARRISON COAL GAS SITE, HUDSON CO.	404422	740921	1.6	70	0110	3070	1	C
1163	OAK ISLAND-CONRAIL TERMINAL, NEWARK, ESSEX CO.	404247	740858	0.4	52			3	
456	CONRAIL+MEADOWS YARD, KEARNY, HUDSON CO.	404439	740845	1.8	52	101	130	1	
573	FEDERATED METALS, NEWARK, ESSEX CO.	404327	740833	0.4	0	130	3070	9	
1248	GUIGNON & GREEN, KEARNY, HUDSON CO.	404515	740830	2.5	53	0130	0101	1	C
780	DISCOVERIES, INC, BAYONNE, HUDSON CO.	403851	740827	4.9	63	0103	3070	1	C
417	TROY CHEM., NEWARK, ESSEX CO.	404323	740824	0.4	38	130	3070	1	
635	80-LISTER AVENUE, NEWARK, (DIOXIN CASE), ESSEX CO.	404507	740815	2.4	72	103	0130	1	B
676	120 LISTER AVE (DIOXIN), NEWARK, ESSEX CO.	404507	740815	2.4	72	0103	0130	1	C
555	CENTRAL STEEL DRUM, NEWARK, ESSEX CO.	404230	740752	1.0	1	130	3070	0	
57	ASHLAND CHEM., NEWARK, ESSEX CO.	404333	740749	0.9	53	130	3070	1	
1086	B M Z CONCRETE, NORTH ARLINGTON, BERGEN CO.	404635	740745	4.1	53	0103	0	1	H
410	INLAND CHEM., NEWARK, ESSEX CO.	404302	740733	1.0	00	3070	0	9	
551	BURMARK IND., NEWARK, ESSEX CO.	404302	740733	1.0	63	130	3070	9	
603	TEXACO TERMINAL, NEWARK, ESSEX CO.	404225	740716	1.4	53	130	3070	9	
1303	DROYERS POINT, JERSEY CITY, HUDSON CO.	404240	740654	1.6	39	0101	0130	1	A
519	SYNCON RESINS, KEARNY, HUDSON CO.	404416	740640	2.1	00	100	3070	1	B
512	ROOSEVELT DRIVE-IN (DAYLIN/GRACE), JERSEY CITY, HUDSON CO.	404252	740608	2.2	39	103	101	5	L
630	MOBAY CHEMICAL CORP., BAYONNE CITY, HUDSON CO.	404117	740603	3.1	00	103	0	9	
1304	ROUTE 185, JERSEY CITY, HUDSON CO.	404110	740603	3.2	39	0130	0101	1	B
383	PSE&G, KEARNY, HUDSON CO.	404416	740550	2.8	38	130	3070	0	
706	ENGLER INSTRUMENTS, JERSEY CITY, HUDSON CO.	404258	740543	2.6	35	0103	3070	1	H
600	STANDARD CHLORINE, KEARNY, HUDSON CO.	404456	740533	3.5	37	103	101	0	
872	TEXTILE PROOFERS, JERSEY CITY, HUDSON CO.	404250	740531	2.0	63	0103	3070	1	B
737	PJP LANDFILL, JERSEY CITY, HUDSON CO.	404127	740506	3.6	58	103	101	9	
578	CONRAIL SECAUCUS, HUDSON CO.	404600	740437	4.7	1	103	102	1	
471	KOPPERS, KEARNY, HUSDON CO.	404447	740419	3.9	1	103	130	5	
609	GARFIELD AVE., 880, JERSEY CITY, HUDSON CO.	404228	740413	4.0	37	103	102	1	
455	DIAMOND SHAMROCK, S. KEARNY, HUDSON CO.	404[illegible]	740410	4.5	75	103	101	1	
772	COLUMBIA PAINT, INC., JERSEY CITY, HUDSON CO.	404215	740350	4.3	00	0103	0110	1	B

Number of Observations: 48

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Page 1 of NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 404305 LAT 740840 LON AS OF 12/22/87 (IN ORDER BY SITE NUMBER) - 04/25/08

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
57	ASHLAND CHEM., NEWARK, ESSEX CO.	404333	740749	0.9	53	130	3070	1	
325	FRONTAGE ROAD DRUM DUMP, NEWARK, ESSEX CO.	404220	740955	1.4	1	0130	0	1	B
383	PSE&G, KEARNY, HUDSON CO.	404416	740550	2.8	38	130	3070	0	
410	INLAND CHEM., NEWARK, ESSEX CO.	404302	740733	1.0	00	3070	0	9	
416	ALBERT STEEL DRUM/PRENTISS DRUG, NEWARK, ESSEX CO. (DIOXIN)	404314	740945	1.0	72	103	130	1	C
417	TROY CHEM., NEWARK, ESSEX CO.	404323	740824	0.4	38	130	3070	1	
455	DIAMOND SHAMROCK, S. KEARNY, HUDSON CO.	404504	740410	4.5	35	103	101	1	
456	CONRAIL-MEADOWS YARD, KEARNY, HUDSON CO.	404439	740845	1.8	52	101	130	1	
471	KOPPERS, KEARNY, HUDSON CO.	404447	740449	3.9	1	103	130	9	
512	ROOSEVELT DRIVE-IN (DAYLIN/GRACE), JERSEY CITY, HUDSON CO.	404252	740608	2.2	39	103	101	5	B
519	SYNCON RESINS, KEARNY, HUDSON CO.	404416	740648	2.1	00	100	3070	1	G
538	J.L. ARMITAGE + CO., NEWARK, ESSEX CO.	404316	741013	1.4	0	130	3070	1	
551	SUNMARK IND., NEWARK, ESSEX CO.	404302	740733	1.0	63	130	3070	9	
555	CENTRAL STEEL DRUM, NEWARK, ESSEX CO.	404230	740752	1.0	1	130	3070	0	
578	CONRAIL SECAUCUS, HUDSON CO.	404600	740457	4.7	1	103	102	1	
593	FEDERATED METALS, NEWARK, ESSEX CO.	404327	740833	0.4	0	130	3070	9	
603	TEXACO TERMINAL, NEWARK, ESSEX CO.	404225	740716	1.4	53	130	3070	9	
608	STANDARD CHLORINE, KEARNY, HUDSON CO.	404456	740533	3.5	39	103	101	4	
609	GARFIELD AVE., 800, JERSEY CITY, HUDSON CO.	404228	740413	4.0	39	103	102	1	
630	MOBAY CHEMICAL CORP., BAYONNE CITY, HUDSON CO.	404117	740603	3.1	00	103	0	9	
635	80-LISTER AVENUE, NEWARK, (DIOXIN CASE), ESSEX CO.	404507	740815	2.4	72	103	0130	1	B
656	COOPER IND (FORM.MCGRAW EDISON), BELLEVILLE, ESSEX CO.	404648	741115	4.8	00	3070	130	1	C
676	120 LISTER AVE (DIOXIN), NEWARK, ESSEX CO.	404507	740815	2.4	72	0103	0130	1	G
693	J.T. BAKER, PHILLIPSBURG, WARREN CO.	404129	741126	3.0	00	130	0010	1	A
702	HARRISON COAL GAS SITE, HUDSON CO.	404422	740921	1.6	70	0110	3070	1	C
708	KAPKOWSKI RD. LANDFILL, ELIZABETH, UNION CO.	404040	741000	3.0	50	100	3070	0	
737	PJP LANDFILL, JERSEY CITY, HUDSON CO.	404127	740706	3.6	58	103	101	9	
772	COLUMBIA PAINT, INC., JERSEY CITY, HUDSON CO.	404215	740350	4.3	00	0103	0110	1	B
780	DISCOVERIES, INC, BAYONNE, HUDSON CO.	403851	740827	4.9	63	0103	3070	1	B
786	ENGLER INSTRUMENTS, JERSEY CITY, HUDSON CO.	404258	740543	2.6	35	0103	3070	1	B
791	GENERAL ELECTRIC CO-NEWARK LAMP PLANT	404347	741135	2.7	00	0103	3070	1	H
792	GEORGIA-PACIFIC CORP—CASTING OPER, NEWARK, ESSEX CO.	404350	740948	1.3	00	0110	3070	1	G
793	GEORGIA-PACIFIC CORP—POLYMER MATE, NEWARK, ESSEX CO.	404350	740948	1.3	00	0110	3070	1	B
796	J & R METALLIZING CO, INC., NEWARK, ESSEX CO.	404330	741017	1.5	00	0110	3070	1	B
819	NUODEX, INC - ELIZABETH PLANT, UNION CO.	403953	740732	3.8	00	0103	0100	1	B
872	TEXTILE PROOFERS, JERSEY CITY, HUDSON CO.	404250	740531	2.8	63	0103	3050	1	B
890	OCCI-FLEUR, NEWARK, ESSEX CO.	404305	740745	0.9	00	0110		1	B
952	ORANGE WATER DEPT., ORANGE, ESSEX CO.	404530	741230	4.4	00	0130	3070	1	C
953	COX RESIDENCE, MONTCLAIR, ESSEX CO.	404245	741345	4.5	0	0140	3070	1	C
1086	B M Z CONCRETE, NORTH ARLINGTON, BERGEN CO.	404535	740745	4.1	53	0103	0	1	B
1095	ARROW ENGINEERING, HILLSIDE, UNION CO.	404141	741538	4.5	53	0000	0	1	B
1163	OAK ISLAND-CONRAIL TERMINAL, NEWARK, ESSEX CO.	404247	740558	0.4	52			3	
1182	FRANKLIN PLASTICS, KEARNY, HUDSON CO.	404525	740745	2.8	34	0100	3070	1	B
1248	GUIGNON & GREEN, KEARNY, HUDSON CO.	404515	740830	2.5	53	0130	0101	1	C
1303	DROYERS POINT, JERSEY CITY, HUDSON CO.	404240	740524	1.6	39	0101	0130	1	A
1304	ROUTE 185, JERSEY CITY, HUDSON CO.	404110	740605	3.2	39	0130	0101	1	B
1317	RUGER CHEMICAL, IRVINGTON, ESSEX CO.	404230	741300	3.2	00	0100	3070	1	C
1321	J.F.HENRY CHEMICAL CO., NEWARK, ESSEX CO.	404210	741135	2.8	63	0100	3070	1	B

Number of Observations: 48

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Page 1 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 404305 LAT. 740840 LON. (IN ORDER BY DECREASING LONGITUDE) - 04/25/88

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEOL	FLOW	CAPACITY
2056P	ATLAS TOOL COMPANY, INC.	2601171		404204	741405		4.9	39	07	138	GTRB		[illegible]
2055P	ATLAS TOOL COMPANY, INC.	2602079		404204	741405		4.9	39	07	300	GTRB		[illegible]
2107P	TUSCAN DAIRY FARMS INC	4600102	1	404221	741401		4.8	39	19	300	GTRB		[illegible]
2107P	TUSCAN DAIRY FARMS INC	2604886	2	404221	741401		4.8	39	19	620	GTRB		350
2168P	SECUR-IMAGE TECHNOLOGIES INC.	2603615	2	404128	741334		4.7	39	07	461	GTRB		[illegible]
2081P	CERTIFIED PROCESSING CORP.	460094	1	404136	741326	F	4.5	21	07	202	GTRB		[illegible]
2081P	CERTIFIED PROCESSING CORP.	2604624	3	404136	741326	F	4.5	21	07	250	GTRB		
2106P	JERSEY PLASTIC MOLDERS, INC.	2604728	2	404301	741322		4.1	13	09	330	GTRB		165
2081P	CERTIFIED PROCESSING CORP.	2600265	2	404130	741320	F	4.5	21	07	630	GTRB		[illegible]
2306P	HAYWARD MANUFACTURING PRODUCTS	2604712	1	404019	741154		4.3	39	19	274	GTRB		100
2306P	HAYWARD MANUFACTURING PRODUCTS	2606867	2	404039	741141		3.8	39	19	275	GTRB		100
10553W	NEW JERSEY BELL TELEPHONE	2603173	1	404433	741015		2.2	13	14	215	GTRB		60
10546W	PUBLIC SERVICE ELECTRIC & GAS	4600103	1	404410	740930	F	1.4	17	04	216	GTRB		[illegible]
2073P	INTERNATIONAL MINERALS & CHEM.	4600072	1	404700	740900	T	4.5	13	01	352	GTRB		100
2073P	INTERNATIONAL MINERALS & CHEM.	4600073	2	404700	740900	T	4.5	13	01	400	GTRB		[illegible]
2073P	INTERNATIONAL MINERALS & CHEM.	2605113	3	404700	740900	T	4.5	13	01	400	GTRB		[illegible]
2320P	HONEYCOMB PLASTICS CORP.	4600102	1	404506	740838	S	2.3	17	07	500	GTRB		[illegible]
2320P	HONEYCOMB PLASTICS CORP.	2602304	2	404506	740838	S	2.3	17	07	700	GTRB		[illegible]
10514W	NUSON METALS CORP.	2604993	3	404342	740835	T	0.7	13	14	165			100
10512W	V.H. SWENSON CO., INC.	2602717	1	404408	740809	F	3.5	17	07	400	GTRB		[illegible]
10514W	NUSON METALS CORP.	2603408	1	404358	740808	T	1.1	13	14	300	GTRB		[illegible]
1041D	AMERICAN REF-FUEL COMPANY	175 WELL	POINTS	404415	740735	F	1.6	13	14	35	QUSD		[illegible]
1050D	PORT LIBERTE PARTNERS			404150	740410	F	4.3	17	05				[illegible]
2051P	LIBERTY HILLSIDE ASSOC.	4600077	STANDBY	404147	740341		4.6	39	07	275	GTRB		[illegible]
2051P	LIBERTY HILLSIDE ASSOC.	4600078	STANDBY A	404141	740341		4.6	39	07	186	GTRB		250
2051P	LIBERTY HILLSIDE ASSOC.	4600079	MAIN B	404141	740341		4.6	39	07	400	GTRB		465
2051P	LIBERTY HILLSIDE ASSOC.	2600418	MAIN D	404141	740341		4.6	39	07	400	GTRB		[illegible]
2057P	SPINNERIN YARN CO., INC.	4600174	1	404210	740303	F	5.0	03	59	230	GTRB		120

Number of Observations: 28

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PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 404305 LAT. 740840 LON. (IN ORDER BY PERMIT NUMBER) - 04/25/88

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
[illegible]	AMERICAN REF-FUEL COMPANY	[illegible]	[illegible]	404415	740733	[illegible]	1.6	13	14	35	GOSD		200
[illegible]	V. HALSWENSON CO., INC.	[illegible]	[illegible]	404608	740809	F	3.5	17	07	400	GTRB		150
[illegible]	RONSON METALS CORP.	[illegible]	[illegible]	404558	740808	T	1.1	13	14	300	GTRB		150
[illegible]	RONSON METALS CORP.	[illegible]	[illegible]	404342	740835	T	0.7	13	14	165			100
[illegible]	PUBLIC SERVICE ELECTRIC & GAS	[illegible]	[illegible]	404410	740930	F	1.4	17	04	216	GTRB		200
[illegible]	NEW JERSEY BELL TELEPHONE	[illegible]	[illegible]	404433	741015	[illegible]	2.2	13	14	215	GTRB		500
[illegible]	PORT LIBERTE PARTNERS	[illegible]	[illegible]	[illegible]	740410	F	4.3	17	06				200
[illegible]	LIBERTY HILLSIDE ASSOC.	[illegible]	STANDBY	[illegible]	740341	[illegible]	4.6	39	07	275	GTRB		200
[illegible]	LIBERTY HILLSIDE ASSOC.	[illegible]	STANDBY A	404141	740341	[illegible]	4.6	39	07	186	GTRB		250
[illegible]	LIBERTY HILLSIDE ASSOC.	[illegible]	MAIN B	404141	740341	[illegible]	4.6	39	07	400	GTRB		465
[illegible]	LIBERTY HILLSIDE ASSOC.	[illegible]	MAIN D	404141	740341	[illegible]	4.6	39	07	400	GTRB		350
[illegible]	ATLAS TOOL COMPANY INC.	[illegible]	[illegible]	404204	741405	[illegible]	4.9	39	07	138	GTRB		200
[illegible]	ATLAS TOOL COMPANY INC.	[illegible]	[illegible]	404204	741405	[illegible]	4.9	39	07	300	GTRB		200
[illegible]	SPINNERIN YARN CO. INC.	[illegible]	[illegible]	404210	[illegible]	T	5.0	03	59	230	GTRB		120
[illegible]	INTERNATIONAL MINERALS & CHEM.	[illegible]	[illegible]	404700	740900	T	4.5	13	01	352	GTRB		100
[illegible]	INTERNATIONAL MINERALS & CHEM.	[illegible]	[illegible]	404700	740900	T	4.5	13	01	400	GTRB		150
[illegible]	INTERNATIONAL MINERALS & CHEM.	[illegible]	[illegible]	404700	740900	T	4.5	13	01	400	GTRB		150
[illegible]	CERTIFIED PROCESSING CORP.	[illegible]	[illegible]	[illegible]	741326	F	4.5	21	07	202	GTRB		100
[illegible]	CERTIFIED PROCESSING CORP.	[illegible]	[illegible]	[illegible]	741320	F	4.5	21	07	630	GTRB		250
[illegible]	CERTIFIED PROCESSING CORP.	[illegible]	[illegible]	[illegible]	741326	F	4.5	21	07	250	GTRB		
[illegible]	JERSEY PLASTIC MOLDERS INC.	[illegible]	[illegible]	[illegible]	741322	[illegible]	4.1	13	09	330	GTRB		185
[illegible]	TUSCAN DAIRY FARMS INC.	[illegible]	[illegible]	404221	741401	[illegible]	4.8	39	19	300	GTRB		250
[illegible]	TUSCAN DAIRY FARMS INC.	[illegible]	[illegible]	404221	741401	[illegible]	4.8	39	19	620	GTRB		350
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.7	39	07	461	GTRB		200
[illegible]	HAYWARD MANUFACTURING PRODUCTS	[illegible]	[illegible]	404019	[illegible]	[illegible]	4.3	39	19	274	GTRB		100
[illegible]	HAYWARD MANUFACTURING PRODUCTS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	39	19	275	GTRB		100
[illegible]	HONEYCOMB PLASTICS CORP.	[illegible]	[illegible]	404504	740838	[illegible]	2.3	17	07	500	GTRB		210
[illegible]	HONEYCOMB PLASTICS CORP.	[illegible]	[illegible]	404504	740838	B	2.3	17	07	700	GTRB		500

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ATTACHMENT A

SITE: Hummel
LOCATION: Newark

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SUMMARY OF SAMPLING DATA
VOLATILES

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	MW-1	SW-1	SW-4	S-1	S-2	S-4	S-5	S-6	S-7	S-9	S-10	S-11	S-12	S-14	Sed-1	Sed-2
Chloromethane																
Bromomethane																
Vinyl Chloride															29	
Chloroethane																
Methylene Chloride																
Acetone																
Carbon Disulfide	.7J											5J				
1,1-Dichloroethene				7												
1,1-Dichloroethane			15J												2J	
1,2-Dichloroethene			270					1J	1J	9J		15		250J	5J	
Chloroform										67						
1,2-Dichloroethane								3J		28						
2-Butanone																660
1,1,1-Trichloroethane				E				1J		2J		8J	7		12	110
Carbon Tetrachloride																
Xylenes		53		5J	52,000	3J	1J	78	3J		120	490	5J	8300	200	1800

SITE: Hummel
LOCATION: Newark

ATTACHMENT A

SUMMARY OF SAMPLING DATA
VOLATILES

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	Sed-3	Sed-4	Sed-5
Chloromethane			
Bromomethane			
Vinyl Chloride			
Chloroethane			
Methylene Chloride			9900
Acetone			25,000
Carbon Disulfide		14J	
1,1-Dichloroethene			
1,1-Dichloroethane		16J	7,100
1,2-Dichloroethene		58	81,000
Chloroform			
1,2-Dichloroethane			5,300
2-Butanone			5,000J
1,1,1-Trichloroethane		110	15,000
Carbon Tetrachloride			
Xylenes	14J	280	99,000

ATTACHMENT A

SUMMARY OF SAMPLING DATA
VOLATILES (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	MW-1	MW-2	SW-1	SW-2	SW-3	SW-4	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9
Vinyl Acetate															
Bromodichloromethane															
1,1,2,2-Tetrachloroethane															
1,2-Dichloropropane															
trans-1,3-Dichloropropene															
Trichloroethene						7J						30	3J		48 34
Dibromochloromethane															
1,1,2-Trichloroethane															
Benzene	6	4J		.7J	7J	43J		570J	24		53				
cis-1,3-Dichloropropene															
Bromoform															
4-Methyl-2-Pentanone						57J						36			
2-Hexanone															
Tetrachloroethene							4J	250J	300	6		13	3J	2J	6200
Toluene			11	.9J	4J	120	2J	18J			1J	88	3J		
Chlorobenzene					39	77		3100		9		7	12		
Ethylbenzene			6					3400					2J	13	
TIC's (total)	20 J	40 J	50	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

ATTACHMENT A

SUMMARY OF SAMPLING DATA
VOLATILES (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-10	S-11	S-12	S-13	S-14	Sed-1	Sed-2	Sed-3	Sed-4	Sed-5
Vinyl Acetate			3J							
Bromodichloromethane										
1,1,2,2-Tetrachloroethane										
1,2-Dichloropropane										
trans-1,3-Dichloropropene										
Trichloroethene			2J		120J	36			27J	3100J
Dibromochloromethane										
1,1,2-Trichloroethane										
Benzene							7J		7J	520J
cis-1,3-Dichloropropene										
Bromoform										
4-Methyl-2-Pentanone							3300			
2-Hexanone										
Tetrachloroethene	24	69	83	120	160J	3J	15J		7J	10,000
Toluene	15	96	27			10	130	100	53	96,000
Chlorobenzene						32	160	34	970	33,000
Ethylbenzene		60	12		3000	35	170		4.2	
TICs (total)	43,400	774,500	2,608	110 J	29,[illegible]J	56J	75,800J	2,200J		

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ATTACHMENT A

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-2	S-5	S-7	S-9	S-12	S-13	S-15	Sed-1	Sed-3	Sed-4	Sed-5	SW-3
bis (2-Chloroethoxy) methane												
2,4-Dichlorophenol							780					
1,2,4-Trichlorobenzene								6200J		170,000		51J
Naphthalene	1100J	850J	900J					1700J			36,000J	24J
4-Chloroaniline						600J						
Hexachlorobutadiene												
4-Chloro-3-methylphenol												
2-Methylnaphthalene	1900JB			410JB				960JB	2100JB		48,000J	J
Hexachlorocyclopentadiene												
2,4,6-Trichlorophenol							380J					
2,4,5-Trichlorophenol												
2-Chloronaphthalene												
2-Nitroaniline					5800J							
Dimethylphthalate												
Acenaphthylene												
2,6-Dinitrotoluene												

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-5	S-7	S-9	S-13	Sed-1	Sed-4	Sed-5	SW-1	SW-3	SW-4
Phenol		5700 J		6500 J						
bis(2-Chloroethyl) ether										
2-Chlorophenol										
1,3-Dichlorobenzene						56,000			190	
1,4-Dichlorobenzene	180 J				2100 J	24,000		1 J	310	
Benzyl alcohol										
1,2-Dichlorobenzene							14,000 J		11 J	
2-Methylphenol										
bis(2-Chloroisopropyl) ether										
4-Methylphenol										
N-Nitroso-di-n-propylamine										
Hexachloroethane										
Nitrobenzene										
Isophorone										
2-Nitrophenol										
2,4-Dimethylphenol										
Benzoic acid			12,000JB							420 J

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SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-2	S-3	S-4	S-5	S-6	S-7	S-9	S-12	S-13	S-14	S-15	Sed-3
3-Nitroaniline												
Acenaphthene												
2,4-Dinitrophenol												
4-Nitrophenol												
Dibenzofuran	470J											
2,4-Nitrotoluene												
Diethylphthalate										13,00J		
4-Chlorophenyl-phenylether												
Fluorene												
4-Nitroaniline												
4,6-Dinitro-2-methylphenol												
N-Nitrosodiphenylamine												
4-Bromophenyl-phenylether												
Hexachlorobenzene												
Pentachlorophenol												
Phenanthrene	1500JB	5000JB	8300JB	1800JB	8700JB	4000JB	400JB	10,000B	570JB		290JB	2100JB
Anthracene				310J				55J				

J

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	sed-5
3-Nitroaniline	
Acenaphthene	
2,4-Dinitrophenol	
4-Nitrophenol	
Dibenzofuran	
2,4-Nitrotoluene	
Diethylphthalate	
4-Chlorophenyl-phenylether	
Fluorene	20,000 J
4-Nitroaniline	
4,6-Dinitro-2-methylphenol	
N-Nitrosodiphenylamine	
4-Bromophenyl-phenylether	
Hexachlorobenzene	
Pentachlorophenol	
Phenanthrene	36,000 JB
Anthracene	

ATTACHMENT A

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11
Di-n-butylphthalate	990 JB	770 JB	3400 JB	6200 JB	400 JB	2200 JB	3000 JB		1800 JB		
Fluoranthene		2000 JB	5100 JB	9700 B	2000 JB	13,000 JB	6900 JB	1300 JB			
Pyrene	1200 JB	1200 B	4400 JB	7400 JB	2200 JB	12,000 JB	7200 JB	1100 JB	1700 JB		4100 JB
Butylbenzylphthalate											
3,3-Dichlorobenzidine											
Benzo (a) anthracene		1300 J	3400 J	4200 J		6200 J	3800 J				
Chrysene		2500 J		4200 J		6700 J	4800 J				
bis(2-Ethylhexyl) phthalate	1600 JB	70,000 B	86000 B	86,000 B	120,000 B			20,000 B	27,000,000 B	21,000 B	7400 JB
Di-n-octylphthalate						4400 J	2400 J				
Benzo (b) fluoranthene		2800 JB	3600 JB	3500 JB	1300 JB	8500 JB	4700 JB				
Benzo (k) fluoranthene		1500 JB		3800 JB	910 JB	5600 JB	3900 JB				
Benzo (a) pyrene		480 JB		3500 JB	910 JB	6600 JB	3800 JB				
Indeno (1,2,3-cd) pyrene		1600 J					2400 J				
Dibenz (a,h) anthracene		780 J									
Benzo (g,h,i) perylene		610 J			820 J						
TICs (total	400,000	96,000	760,000	9000	321,000	50,000	46,000	30,000	2.02×10^6	248,000	1.69×10^6

ATTACHMENT A

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-12	S-13	S-14	S-15	Sed-1	Sed-2	Sed-3	Sed-4	Sed-5	SW-1	SW-2	SW-3
Di-n-butylphthalate	590 JB		2800 JB	73 JB	910 JB	1200 JB	1200 JB	3000 JB		2 JB	2 JB	8 JB
Fluoranthene	13,000 B	1200 JB		470 B			2600 JB		6,900 JB	--		
Pyrene	10,000 B	1200 JB	5600 JB	500 B			2500 JB		11,000 JB			
Butylbenzylphthalate	1,100 JB								53,000 B			
3,3-Dichlorobenzidine												
Benzo (a) anthracene	5,100 J			250 J			1000 J					
Chrysene	11,000	1500 J		310 J			2100 J					
bis(2-Ethylhexyl) phthalate	11000 B		6,2000 B	6600 B	4900 JB	3100 JB	33,000 B	37,000 JB	2,600,000 B	10 JB	11 JB	82 D
Di-n-octylphthalate			10000 J				1700 J					
Benzo (b) fluoranthene	7700 B	1800 JB		250 JB								
Benzo (k) fluoranthene	6,500 B	1400 JB		200 JB								
Benzo (a) pyrene	5000 JB	1100 JB		200 JB								
Indeno (1,2,3-cd) pyrene	3300 J	1100		140 J								
Dibenz (a,h) anthracene												
Benzo (g,h,i) perylene	4100 J	1500		170 J								
TIC's (total)	135,000	383,000	2.2×10^6	10,100	56,000	920,000	439,900	470,000	3.24×10^6	46	34	570

ATTACHMENT A

SUMMARY OF SAMPLING DATA
SEMI-VOLATILE COMPOUNDS (CONT.)

DATE SAMPLED 11-14-86
SAMPLE NO.
MATRIX
UNITS ppb

	S,10-4	FB
Di-n-butylphthalate		3JB
Fluoranthene		
Pyrene		
Butylbenzylphthalate		
3,3-Dichlorobenzidine		
Benzo (a) anthracene		
Chrysene		
bis(2-Ethylhexyl) phthalate	210JB	12B
Di-n-octylphthalate		
Benzo (b) fluoranthene		
Benzo (k) fluoranthene		
Benzo (a) pyrene		
Indeno (1,2,3-cd) pyrene		
Dibenz (a,h) anthracene		
Benzo (g,h,i) perylene		
TIC'S (total	7200	

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ATTACHMENT 4

SUMMARY OF SAMPLING DATA
PESTICIDES AND PCBs

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	SW-2	S-2	S-3	S-4	S-5	S-15	Sed-1	Sed-2	Sed-4	Sed-5	
alpha-BHC											
beta-BHC											
delta-BHC											
gamma-BHC											
Heptachlor											
Aldrin		1000	300J								
Heptachlor epoxide											
Endosulfan I	.08J										
Dieldrin		7700	4200	610	100J	15J	170J	1900	6700		
4,4' -DDE					66J						
Endrin											
Endosulfan II											
4,4' -DDD					1600			130J			
Endosulfan sulfate											
4,4' -DDT							84J			1200J	
Methoxychlor											
Endrin ketone											

ATTACHMENT 4

SUMMARY OF SAMPLING DATA
PESTICIDES AND PCBs (CONT.)

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppb

	S-1	S-2	S-3	S-5	S-6	S-7	S-8	S-10	S-11	S-12	S-13	S-14	S-15	Sed-1	Sed-2	Sed-3	Sed-4	Sed-5
alpha-Chlordane																		
gamma-Chlordane										680J								
Toxaphene																		
Aroclor-1016																		
Aroclor-1221																		
Aroclor-1232																		
Aroclor-1242																		
Aroclor-1248	65,000	3700 J	3100J	1800	8800	68,000	6200J	1000J	65,000	21,000	87,000	17,000	220J	2700	4100	4800J	4200J	19000J
Aroclor-1254																		
Aroclor-1260																		

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ATTACHMENT A

SUMMARY OF SAMPLING DATA
METALS

DATE SAMPLED
SAMPLE NO.
MATRIX
UNITS

ppb (MW-1, MW-2, SW-3, SW-4) ppm →

	MW-1	MW-2	SW-3	SW-4	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12
Aluminum																
Antimony					13.3					23.3	37	13				27.7
Arsenic	2020		87.6	132			25.5	23	31		23.5					23.5
Barium	2206		2950			427	459		529							
Beryllium	[illegible]					1.4				3.6	1.8					1.4
Cadmium	1530	34.9	810	215		3.1	3.1		5.2	15.1	6.6	55			4.3	11.4
Calcium																
Chromium	332		8880	23,500			395			502	371	156				1890
Cobalt																
Copper	2666		24,200	1310			174			1050	283	193	235			269
Iron																
Lead	20400	127	[illegible]	1100	548	1210	1270	720	594	4090	673	537	242	149	6820	2710
Magnesium																
Manganese																
Mercury	4.2	77.1	11.2	3.2	1.2					3.4	3.4	9.6			9.9	
Nickel							697			398	428	220			161	136
Potassium																

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EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D002174712

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Flora may be impacted by hazardous substances disposed by the company, especially dioxin type compounds which may accumulate in plant tissues.
Attachment A pp. 33-34

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Fauna may be impacted by hazardous substances disposed by the company, especially dioxin type compounds which may accumulate in animal tissues.
Attachment A pp 25-33

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Hazardous substances disposed by the company, especially dioxin type compounds which bioaccumulate in animal tissues, may biomagnify through the trophic levels of the food chain. This is of great concern in this area because of the proximity to the Hackensack Meadowlands. Attachment A pp. 25-34

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION
Attachment C, E

Little is known about storage/disposal methods used by Hummel at the Newark facility. However because of the poor housekeeping and operational practices observed at the company's South Plainfield facility, it is likely similar conditions existed in Newark.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Adjacent properties may be damaged by improperly disposed hazardous substances.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Attachment D

Hummel is known to have disposed hazardous substances through floor drains at their South Plainfield facility. It is likely hazardous substances were also disposed of in this manner as well as through storm drains at the Newark site. Floor drains lead to the local sewage authority and storm drains discharge to the Passaic River.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

It is unknown what type of disposal was used at the site by Hummel. However, because of the lack of environmental concern shown by Hummel at its South Plainfield location, it is likely illegal/unauthorized dumping has occurred at the Newark site.
Attachment C,D,E

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: ______

IV. COMMENTS

This company is not related to the Hummel-Lamolin Corp. which is located in the same complex.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

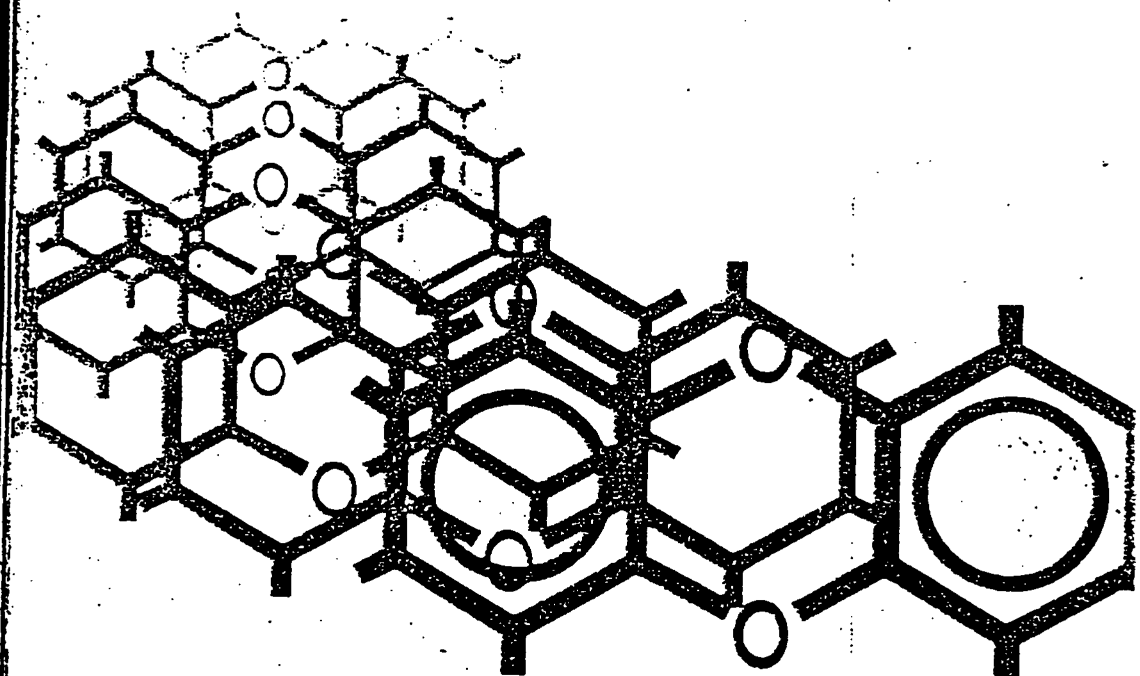
Attachment A - EPA publication - "DIOXINS" - EPA-600/2-80-197
Attachment B - Memos to File
Attachment C,D,E - NJDEP/Hazardous Waste Management/Bureau of Planning and Assessment
Attachment F - Groundwater Survey of Essex County

United States
Environmental Protection
Agency

Industrial Environmental Research
Laboratory
Cincinnati OH 45268

Research & Development

EPA Dioxins



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ATTACHMENT C

Attachment A-1

EPA-600/2-80-197
November 1980

DIOXINS

M.P. Esposito, T.O. Tiernan, and
Forrest E. Dryden

Contract Nos. 68-03-2577
68-03-2659
68-03-2579

Project Officer
David R. Watkins
Industrial Pollution Control Division
Industrial Environmental Research Laboratory
Cincinnati, Ohio 45268

INDUSTRIAL ENVIRONMENTAL RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

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rida. A.F. Armament Lab. AFATL-TR-

-Te chlorodibenzo-p-Dioxin (TCDD) Decontamination Recommendations

En ronmental Fate, and Human Risk ted Dioxin. USAF, OEHL Technical

Ac dental Contamination by TCDD: La ro. 67(5):371–378.

Chlor auf Phenole. Ber., 27:550.

Cl ical Chemistry Effects of 2,3,7,8- ato Animals. Environmental Health

1972. Contamination of the Bay of nlo ated Biphenyls, Polychlorinated iox s, and Dibenzofurans. Environ-

APPENDIX A

The tables that follow list organic chemicals and pesticides selected for study on the basis of potential dioxin contamination, with known producers and production locations, present and past. The primary source of producer information is the Stanford Research Institute Directory of Chemical Producers. The tabulations are by chemical, with producers and locations; and by producer and location, with chemicals. The tabulations by chemical (Tables A1, A2, A3, and A6) are segregated according to the classifications based on dioxin concern as defined in Section 3. The classification information is also noted in the producer location tables by means of Roman numerals following the chemical names.

The tabulations by producer and location (Tables A4 and A7) group all of the critical chemicals involved at each manufacturer location. These lists do not necessarily define the site subject to exposure, because many dumps are remote from the plants; they do provide a starting point for such definition. Abandoned production of a chemical or abandoned facilities may present special problems. Therefore, the production facilities noted since 1968 but no longer active in 1978 are footnoted and are also extracted in separate tables (Tables A5 and A8). Some of these sites remain active in other production, and some may retain production capability and/or minor production of the subject chemical. Other plant sites may be totally deactivated or abandoned. The producer listed is the last known operator.

Some of the company names of producers designate subsidiary or divisional names, with notation of the parent company. Company addresses, from the Stanford Research Institute Directory and from the Thomas Register, are for the last known producer at a given location and are subject to the uncertainties introduced by acquisitions and name changes.

ATTACHMENT C

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ASS III ORGANIC CHEMICALS

er	Location
	Buffalo, NY*
	Ashland, MA
ver em.	Toms River, NJ
	Ashland, MA
r a Chem.	Lock Haven, PA
ine	Lock Haven, PA*
	Deepwater, NJ
	St. Louis, MO*
and Knowles	Fair Lawn, NJ
	Kalama, WA*
	Clifton, NJ*
hen	Kalama, WA
hem	Eddystone, PA
	Los Angeles, CA*
	Edison, NJ*
	Nixon, NJ*
	Fords, NJ*
	Garfield, NJ
	East Rutherford, NJ
	Chattanooga, TN*
	Midland, MI
	St. Louis, MI*
	Rochester, NY
	Rochester, NY
	Rochester, NY
	Rochester, NY
	Deepwater, NJ*
	St. Bernard, OH*
iams	St. Bernard, OH*
	San Diego, CA*
	Rochester, NY
	Bound Brook, NJ
	Edison, NJ*
cid	Metuchen, NJ*
	Deepwater, NJ
a	Sodyeco, NC*
	Luling, LA
	Sauget, IL*

TABLE A3. (continued)

Chemical	Producer	Location
o-Dichlorobenzene	Allied	Syracuse, NY*
	Chem. Products	Cartersville, GA*
	Dover	Dover, OH*
	Dow	Midland, MI
	du Pont	Deepwater, NJ*
	Hooker	Niagara Falls, NY*
	Monsanto	Sauget, IL
	Montrose Chem.	Henderson, NV
	Neville Chem.	Santa Fe Springs, CA*
	Olin	McIntosh, AL*
	PPG	Natrium, WV
	Solvent Chem.	Niagara Falls, NY
		Malden, MA*
	Specialty Organics	Irwindale, CA
	Standard Chlorine	Delaware City, DE
		Kearny, NJ
3,4-Dichlorobenzaldehyde	Tenneco	Fords, NJ
3,4-Dichlorobenzotrichloride	Tenneco	Fords, NJ
3,4-Dichlorobenzotrifluoride	Tenneco	Fords, NJ*
1,2-Dichloro-4-nitrobenzene	Blue Spruce	Bound Brook, NJ
		Edison, NJ*
	Chem. Insecticide	Metuchen, NJ*
	Martin Marietta	Sodyeco, NC*
	Monsanto	Sauget, IL*
	Plastifax	Gulfport, MS
3,4-Dichlorophenylisocyanate	Mobay Chem.	New Martinsville, SC
	Ott Chem.	Muskegon, MI*
3,4-Difluoroaniline	Olin	Rochester, NY
o-Difluorobenzene	Olin	Rochester, NY
1,2-Dihydroxybenzene-3,5-disulfonic acid, disodium salt	Sterling Drug	New York, NY*
2,5-Dihydroxybenzenesulfonic acid	Eastman Kodak	Rochester, NY*
	Nease Chem.	State College, PA*
2,5-Dihydroxybenzenesulfonic, acid, potassium salt	Nease Chem.	State College, PA*
2,4-Dinitrophenol	Martin Marietta	Sodyeco, NC
	Mobay	Bushy Park, SC
2,4-Dinitrophenoxyethanol	Hummel Chem.	Newark, NJ*
		South Plainfield, NJ

(continued)

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TABLE A3. (continued)

Chemical	Producer	Location
3,5-Dinitrosalicylic acid	Eastman Kodak	Rochester, NY
	Hummel Chem.	Newark, NJ*
		South Plainfield, NJ*
	Salsbury Labs	Charles City, IA
Fumaric acid	Allied	Buffalo, NY*
		Moundsville, WV*
	Alberta Gas	Duluth, MN
	Hooker	Arecibo, PR
	Monsanto**	St. Louis, MO
	Petro-Tex	Houston, TX*
	Pfizer	Terre Haute, IN
	Reichold	Morris, IL*
	Stepan Chem.	Fieldsboro, NJ*
	Tenneco	Garfield, NJ
	U.S. Steel	Neville Island, PA
Hexabromobenzene	Velsicol	St. Louis, MI
	Dover	Dover, OH*
Hexachlorobenzene	Hummel Chem.	Newark, NJ*
		South Plainfield, NJ*
	Stauffer	Louisville, KY*
Hexafluorobenzene	PCR	Gainesville, FL
	Whittaker	San Diego, CA*
		Louisville, KY*
Maleic acid	Allied	Buffalo, NY*
		Marcus Hook, PA
		Moundsville, WV*
	Eastman Kodak	Rochester, NY*
	Pfanstiehl Labs	Waukegan, IL
Maleic anhydride	Allied	Moundsville, WV*
	Amoco	Joliet, IL
	Asland	Neal, WV
	Chevron	Richmond, CA*
	Koppers	Bridgeville, PA
		Cicero, IL
	Petro-Tex	Houston, TX*
	Monsanto	St. Louis, MO
	Reichhold	Elizabeth, NJ
		Morris, IL
	Standard Oil of Indiana (see Amoco above)	
	Tenneco	Fords, NJ
	U.S. Steel	Neville Island, PA
o-Nitroanisole	du Pont	Deepwater, NJ
	Monsanto	Sauget, IL*
		St. Louis, MO

(continued)

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TABLE A3. (continued)

Chemical
2-Nitro-*p*-cresol
o-Nitrophenol
Pentabromochlorocyclohexane
Pentabromoethylebenzene
Pentabromotoluene
Pentachloroaniline
Pentafluoroaniline
o-Phenetidine
Phenol (from chlorobenzene)
1-Phenol-2-sulfuric acid, formaldehyde condensate
Phenyl ether
Phthalic anhydride

(continued)

ATTACHMENT C

TABLE A4. (continued)

Producer	Location	Chemical (class)
Fairmount Chem. Co., Inc. 117 Blanchard St. Newark, NJ 07105	Newark, NJ	2-Chloro-1,4-diethoxy-5-nitrobenzene (II)
Fritzsche Dodge and Olcott, Inc. 76 Ninth Av. New York, NY 10011	Clifton, NJ	Benzaldehyde (III)* Phenyl ether (III)*
GAF Corp. 140 West 51st St. New York, NY 10020	Rensselaer, NY	2-Chloro-1,4-diethoxy-5-nitrobenzene (II) 5-Chloro-2,4-dimethoxy-aniline (II) 4-Chlororesorcinol (II)
W. R. Grace and Co. 7 Hanover Square New York, NY 10005	Fords, NJ	Phthalic anhydride (III)*
Great Lakes Chem. Corp. Hwy. 52, Northwest West Lafayette, IN 47906	El Dorado, AR	Decabromophenoxy-benzene (I) Tetrabromobisphenol-A (II)
Guardian Chem. Corp. 230 Marcus Blvd. Hauppauge, NY 11787	Hauppauge, NY	Chlorohydroquinone (II)* 2,4,6-Tribromophenol (I)
Hexcel Corp. 11711 Dublin Blvd. Dublin, CA 94566	Sayerville, NJ	Pentabromoethylbenzene (III)
Hooker Chem. Corp. 1900 St. James Place Houston, TX 77027 Subsid. Occidental Petroluem Corp.	Arecibo, PR	Fumaric acid (III)
	Niagara Falls, NY	Phthalic anhydride (III) *o*-Dichlorobenzene (III)* Tetrachlorophthalic anhydride (III)* 1,2,4,5-Tetrachlorobenzene (III)* 1,2,4-Trichlorobenzene (III)*
	North Tonawanda, NY	Phenol (III)*, **
	South Shore, KY	Phenol (III)*, **
Hummel Chem. Co., Inc. P.O. Box 250 South Plainfield, NJ 07080	Newark, NJ	2,4-Dinitrophenoxyethanol (III)* 3,5-Dinitrosalicylic acid (III)* Hexachlorobenzene (III)* Picric acid (III)*
	South Plainfield, NJ	2,4-Dinitrophenoxyethanol (III) 3,5-Dinitrosalicylic acid (III)* Hexachlorobenzene (III)* Picric acid (III)* Sodium picrate (III)

(continued)

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TABLE A4. (continued)

Producer	Loc[...]
ICC Industries See Solvent Chem.	
Inmont Corp. 1133 Av. of the Americas New York, NY 10036 Subsid. of Carrier Corp.	Carl[...] NOT[...] list[...] ical[...] acc[...] Inm[...]
International Mineral and Chem. Corp. IMC Plaza Libertyville, IL 60048	New[...]
Kalama Chemc, Inc. The Bank of California Center Suite 1110 Kalama, WA	Kal[...]
Kopper Co., Inc. Koppers Bldg. Pittsburgh, PA 15219	Bric[...] Chic[...] Cice[...]
Martin Marietta Corp. 6801 Rockledge Dr. Bethesda, MD 20034	Sod[...]
Maumee Chem. Co. Presumed to be acquired by Sherwin Williams Address not available	St.
Mobay Chem. Co. Penn Lincoln Pkwy. West Pittsburgh, PA 15205	Nev[...]
Monroe Chem. Co. Saville Av. at 4th St. Eddystone, PA Subsid. of Kalama Chem., Inc. (see Kalama)	Edd[...]

(continued)

ATTACHMENT C

Chemical (class)

2,4-Dichlorophenol (I)
-Amino-5-chloro-2-hydroxybenzenesulfonic acid (III)
Fumaric acid (III)
aleic acid (III)
-Phenol-2-sulfonic acid, formaldehyde condensate (III)
Phthalic anhydride (III)
hthalic anhydride (III)
hthalic anhydride (III)
thalic anhydride (III)
Fumaric acid (III)
aleic acid (III)
aleic anhydride (III)
Dichlorobenzene (III)
-Anisidine (III)
-Dichloroaniline (III)
1,2-Dichloro-4-nitrobenzene (III)
-Dichloroaniline (III)
-Dichloro-4-nitrobenzene (III)
o-Dichlorobenzene (III)
leic anhydride (III)
halic anhydride (III)
1,2,4-Trichlorobenzene (III)
halic anhydride (III)
Phthalic anhydride (III)
ichlorobenzene (III)
achlorobenzene (III)
1,2,4,5-Tetrachlorobenzene (III)
Tetrachlorobisphenol-A (II)
achlorobisphenol-A (II)
-Trichlorobenzene (III)
1-Phenol-2-sulfonic acid, aldehyde condensate (III)
ol (III)*
2,4,6-Tribromophenol (I)
aldehyde (III)

TABLE A5. (continued)

Producer	Location	Chemical (class
du Pont	Deepwater, NJ	4-Chloro-2-nitrophenol (III) *o*-Dichlorobenzene (III) 2-Nitro-*p*-cresol (III) *o*-Nitrophenol (III)
Eastern Chem. (Currently Eastern Chem. Div. of Guardian)	Pequannock, NJ	Chlorohydroquinone (II) 2,4,6-Tribromophenol (I)
Eastman Kodak	Rochester, NY	2,5-Dihydroxybenzenesulfonic acid (III) Maleic acid (III)
Fritzsche	Clifton, NJ	Benzaldehyde (III) Phenyl ether (III)
W. R. Grace	Fords, NJ	Phthalic anhydride (III)
Guardian	Hauppauge, NY	Chlorohydroquinone (II)
	Pequannock, NJ	Chlorohydroquinone (II) 2,4,6-Tribromophenol (I)
Hooker	Niagara Falls, NY	*o*-Dichlorobenzene (III) Tetrachlorophthalic anhydride (III) 1,2,4,5-Tetrachlorobenzene (III) 1,2,4-Trichlorobenzene (III)
	North Tonawanda, NY	Phenol (III)*
	South Shore, KY	Phenol (III)*
Hummel Chem.	Newark, NJ	2,4-Dinitrophenoxyethanol (III) 3,5-Dinitrosalicylic acid (III) Hexachlorobenzene (III) Picric acid (III)
	South Plainfield, NJ	3,5-Dinitrosalicylic acid (III) Hexachlorobenzene (III) Picric acid (III)
Inmont (formerly Interchemical Corp.)	Carlstadt, NJ	3,5-Dichlorosalicylic acid (III)
Koppers	Chicago, IL	Phthalic anhydride (III)
	Cicero, IL	Maleic anhydride (III)
Martin Marietta	Sodyeco, NC	2,6-Dibromo-4-nitrophenol (II) 3,4-Dichloroaniline (III) 1,2-Dichloro-4-nitrobenzene (III) Sodium picrate (III)

(continued)

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ATTACHMENT C

Form ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO FILE DATE 26 AUG 1987

FROM RB ROBERT BERETSKY, HSMS IV, BUREAU OF PLANNING AND ASSESSMENT

SUBJECT HUMMEL CHEMICAL COMPANY, NEWARK, ESSEX COUNTY

The writer spoke with Mr. Bernard Shoen of the Hummel Chemical Company concerning their facility in Newark, Essex County.

According to Mr. Shoen, the company was located at 185 Foundry St., in Newark but has not operated at the site for approximately 25 years. Mr. Shoen stated the company may have leased building #18 but he was not certain. He also stated that approximately 90% of the operation at the Newark facility consisted of warehousing.

The writer also spoke with officials of the Norpak/KEM Realty Company which had owned the property in the mid 1960's. According to Mr. Corasi of Norpak, Hummel Chemical did lease property at 185 Foundry St., but they could not find any records stating what buildings Hummel may have occupied.

HS203:mz

ATTACHMENT D

Attachment B-1

Form ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO FILE DATE SEP 14 1987

FROM ROBERT BERETSKY, RB HSMS IV, BUREAU OF PLANNING AND ASSESSMENT

SUBJECT HUMMEL CHEMICAL COMPANY, NEWARK, ESSEX COUNTY

On 9/8/87, the writer spoke with Chief Busini of the Newark Fire Department concerning the subject facility. Chief Busini stated he spoke with fire inspectors who investigate the Foundry Street area but none of them have been with the fire department long enough to remember Hummel Chemical. Chief Busini then referred the writer to Newark Fire Department Engine 16 (201/733-7461) who are first responders to many fires. The writer spoke with Mr. Mertz of Engine 16 who stated he remembers Hummel Chemical being in the Foundry Street complex but does not know what buildings they occupied. Mr. Mertz also stated they responded to numerous fires and chemical spill incidents at the Foundry St. complex but he does not remember if any were at the Hummel Chemical facility.

HS203:mz

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ATTACHMENT D

State of New Jersey

DEPARTMENT OF HEALTH
JOHN FITCH PLAZA
CN 360, TRENTON, N.J. 08625

February 8, 1982

Dr. Ramsey Christian
Compliance Officer
Hummel Chemical Company, Inc.
Harmich and Metuchen Roads
South Plainfield, New Jersey 07080

Dear Dr. Christian:

Enclosed please find a copy of our report on Hummel Chemical Company, Inc. It contains a brief description of the plant as well as an account of the two accidents which occurred in December of 1981. There are also recommendations included in the report, although they do not cover all areas of concern.

Andrew Rowland, an Occupational Health Specialist in our Program, will be contacting you to arrange health and safety training for your employees. We appreciate your cooperation and concern in this matter.

Sincerely,

Jerry Roseman
Program Specialist III
Occupational Health Program

JR/jmc

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ATTACHMENT E-1

Attachment C-1

SECTION I - INTRODUCTION

Following is a report which discusses three site visits conducted at Hummel Chemical Company during December of 1981. Also included are recommendations regarding engineering controls, work practices and employee education aimed at reducing potentially hazardous occupational exposures at the plant.

Hummel Chemical Company, Incorporated, is presently located in South Plainfield, New Jersey. Previously the plant was located in Newark, New Jersey. The warehouse at the South Plainfield site is approximately 25,000 square feet in size. Hummel employs between 15 and 20 people. The company operates primarily as a chemical wholesaler; that is, a number of different chemicals are bought in relatively large quantities and are subsequently resold in smaller amounts, often with little or no processing. Sometimes, however, Hummel Chemical mixes, sifts, screens, mills or reacts chemicals in order to produce a desired product. The greatest potential for hazardous occupational exposures exists during these operations.

SECTION II - BACKGROUND

Hummel Chemical Company, Incorporated, is a small chemical wholesaler which engages in chemical processing to a limited degree. Most of the processing is mixing, milling and screening a variety of materials. A small percentage of production involves reacting chemicals such as hexachlorobenzene, hydrazine and others to produce contracted compounds.

There are a number of toxic chemicals on site at Hummel Chemical. Many of these pose a serious fire and/or explosion hazard as is evidenced by the history of such incidents at the South Plainfield Plant. Since

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ATTACHMENT E

Hummel has been operating in South Plainfield there have been eight fires and one explosion reported. Most of the fires seem to be associated with similar causal conditions. There are many chemicals in the plant that are strong oxidizers. These include potassium nitrate, sodium nitrate and ammonium perchlorate, among others. Hummel also stores a number of organic chemicals, which can act as fuels. The fire and explosion hazards arise when an oxidizer comes in contact with a fuel in the presence of a spark, flame or some other ignition source. At Hummel, it appears that many of the fires started in those areas of the plant where the milling, mixing or screening of oxidizing materials are performed.

The two most recent accidents at the plant occurred on 12/1/81, and on 12/3/81. On 12/1/81 there was a fire at Hummel Chemical Company in which one employee was injured. Two days later there was an explosion at the plant. No one was injured in the second accident, although parts of the building suffered significant structural damage. According to South Plainfield Fire Chief John Cotone, the fire department is developing recommendations for Hummel Chemical to reduce the potential fire and explosion risks at the plant.

The Occupational Health Program was made aware of the situation at Hummel Chemical Company by Robert Kunze, Middlesex County Occupational Health Inspector. Mr. Kunze and the South Plainfield Fire Department, as well as the New Jersey Department of Environmental Protection's Hazard Management Unit, responded to both accidents.

According to company statements the operation that was being performed at the time of the 12/1 fire involved the screening of a product called SDR. SDR is a mixture of potassium nitrate, charcoal and sulfur. Ramsey Christian, the firm's compliance officer, informed us on our first visit to the plant on 12/10/8 that the exact cause of the fire was unknown; however, he felt that during the screening process a more active mixture than the one they were attempting to produce may have inadvertently formed. It was this "active mixture" which could have been ignited if a spark was produced by dragging one of the steel rimmed drums across the concrete floor. On 12/3/81, Hummel Chemical Company was again the scene of an accident. This time an explosion occurred as the result of a reaction between chlorodinitrobenzene and ethylene glycol, which was being carried out in a 150 gallon stainless steel jacketed reactor. The material produced by the reaction of these two chemicals was dinitrophenoxyethanol, a plasticizer used in rocket motor fuel. Again, Hummel representatives stated that they had been unable to discover the reasons for the accident.

SECTION III - DESCRIPTION OF PLANT OPERATIONS AND HAZARDS

The fire that occurred on 12/1/81 started in the "pit area" of the plant. Two types of operations are carried out in the pit area - milling and screening/sifting. Both processes are similar in that a powdered or crystalline raw material is poured through a screen in the floor of the upper level in the area. It then passes through a cloth tube before entering either the milling or screening/sifting machinery. After processing, the refined product is collected in fiber drums which are then sealed and prepared for shipment.

On 12/10/81 and 12/21/81 I, along with Middlesex County Health Inspector Robert Kunze, identified a number of potentially hazardous conditions at the plant. There was inhalation hazard posed by high concentrations of dust in the air of the pit area. We also experienced irritation to the skin, eyes and mucous membranes by certain chemicals (eg. potassium nitrate). There is also a potential risk of fire and/or explosion if high concentrations of oxidizers in the room air come into contact with a "fuel" in the presence of ignition source. In addition, there were potential health hazards associated with high noise levels and by the storage and handling of highly toxic and, in some cases, carcinogenic chemicals.

On 12/21/81, Hummel Chemical Company was engaged in the milling of pure potassium nitrate using the process described above. Two employees, one on the upper level and the other in the pit area, were responsible for the operation being performed. As the employee on the upper level slit open the bags of powdered potassium nitrate and poured it through the screen in the floor, large clouds of dust were evolved. As the potassium nitrate passed from the cloth tube into the milling machine clouds of dust again escaped into the workroom air. Finally, on the floor of the pit area where the second employee stood with the fiber drums to be filled, large quantities of dust covered the floor and contaminated the entire area. All walking - working surfaces were coated with dust. Both Robert Kunze and I experienced coughing and choking and a burning sensation to the skin, due to the concentration of potassium nitrate dust in the air. We were observing the operation from the warehouse where a number of highly toxic organic chemicals are stored. That the dust was present in the warehouse as well as the pit area is a source of concern.

SECTION IV - RECOMMENDATIONS

We feel that the employees at Hummel Chemical Company face a potentially hazardous situation. This judgement is based on the following factors: (1) A history of fires at Hummel Chemical Company; (2) Poor workpractices and housekeeping at the South Plainfield plant; (3) High dust concentrations in the pit area of the plant which may pose a health hazard as well as a fire hazard; (4) Employee exposure to high noise levels; (5) The lack of adequate ventilation or other engineering controls as a mechanism for reducing dust levels; (6) The lack of protective equipment worn by employees; and (7) The lack of effective worker education at Hummel Chemical Company.

It is hoped that the following recommendations, when implemented, will begin to minimize the health and safety hazards faced by employees at Hummel Chemical Company. These recommendations do not represent a final or a comprehensive effort at correcting all the problems discussed in this report. Hummel Chemical Company should work with a qualified ventilation engineer in order to develop engineering controls based on the recommendations made in this section. Only with the help and cooperation of Hummel Chemical Company can we completely address and correct the wide range of health and safety problems which exist at the plant.

(1) In order to minimize dust exposure to employees who are pouring chemicals through the grating in the floor of the upper level of the pit area, a portable canopy-type enclosure arrangement should be used to enclose the floor screening. The hood should include a slot into which a knife blade is mounted and which would be used to slit open the bags of material.

(2) Consideration should be given to replacing the cloth tube used during milling operations with tubing material that would not retain large amounts of dust. This material, possibly plastic, should form a dust tight seal with any equipment it feeds into.

(3) Another source of high dust exposure occurs as the material passes from the milling machinery into drums. There are a number of different types of drum hoods connected to a local exhaust system leading to a bag house which would be appropriate.

(4) In consultation with a ventilation engineer it might prove feasible to design a ventilation system which encloses the entire milling and drum-filling operation. We could work with Hummel in contacting a consultant and in designing an acceptable system.

(5) Drums should be made of materials that are flame resistant. To prevent the build-up of static electrical charges, drums, especially those with metal or plastic rims, should not be dragged across the workroom floor. A handtruck could be used to move the drums.

* Enclosed find copies of diagrams on bag filling and barrel filling operations from the "Industrial Ventilation Manual." Hopefully these can serve as illustrations of the types of designs which you could adopt.

(6) All tools, including shovels, used in the pit area of the plant should be composed of non-sparking alloys such as beryllium or copper. A listing of local manufactures of such tools is attached.

(7) If the Portasifter will be used to sift materials directly into drums, a gasket of some type must be used to provide a dust-proof seal. In order to minimize dust exposures to employees engaged in pouring chemicals through the sifter a hood arrangement similar to the one discussed in (1) of this section could be used.

(8) Employees who work in the pit area performing milling and sifting operations should wear approved NIOSH respirators equipped with the proper filtering medium. They should also wear gloves and protective goggles. The health department can provide a listing of approved equipment.

(9) Employee education should be conducted at Hummel Chemical Company covering such issues as exposure to toxic substances, the risk of fire and explosion in the pit area, the importance of personal protective equipment and other relevant topics.

The above recommendations are by no means exhaustive and deal primarily with the fire and explosion risks which exist at the plant. Further investigation and discussion need to be conducted with representatives of Hummel Chemical Company in order to effectively address some of the other potential health and safety problems faced by Hummel employees.

STATE OF NEW JERSEY

DEPART CONSERVATION

AND I DEVELOPMENT

DIVI WATER POLICY

SUPPLY

SPECIAL REPORT NO. 28

GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

Prepared in cooperation with
United States Department of the Interior
Geological Survey

1968

ATTACHMENT F

Attachment F1

volume of void to the total volume of unconsolidated sediment is considerably greater than the ratio of the volume of fracture openings to the total volume of rock. The interstitial openings in clays and silts are so small, however, that they restrict the movement of water, even though the percentage of void space may be great.

WATER-BEARING PROPERTIES OF MAJOR GEOLOGIC UNITS

Consolidated Rocks

Rocks of the Brunswick Formation are the main source of ground water in Essex County. The shales and sandstones are generally capable of sustaining moderate to large yields to wells. The Watchung basalt commonly is capable of yielding only small to moderate quantities of water.

Water in these rocks occurs under both unconfined and confined conditions. Unconfined ground water occurs mainly in the upland areas where overlying unconsolidated deposits are thin or absent. Confined and semiconfined ground water conditions exist in lowland areas in Newark, parts of Fairfield, and along the Passaic River where clay beds in the unconsolidated Quaternary deposits mantle the underlying rocks. Wherever such confinement occurs, water beneath the relatively impermeable confining layers is commonly under artesian pressure. In many areas, such as parts of Fairfield and in the northern part of the county, water in wells tapping the confined aquifers will rise above the top of the aquifer and sometimes near or above land surface. In areas subjected to heavy pumping, such as the Newark area and western Millburn Township, the artesian pressure may be considerably reduced. Parts of the confined aquifer may even become dewatered as has happened in part of Newark, in which case the water remaining in the aquifer is no longer confined.

Confined ground water is also encountered in the shales and sandstone directly beneath the basalt flows in the western part of the county downdip from the outcrop area. Confined or semiconfined ground-water conditions may occur in some areas because of differences in permeability within the rock layers resulting from variations in fracturing or weathering or a combination of both.

Some of the various systems of joints and fractures in the consolidated rocks intersect so that water can move vertically as well as horizontally and zones of high secondary porosity are then interconnected. Most wells tapping these rocks draw water from more than one water-bearing zone. However, these zones in the Brunswick Formation have not yet been accurately defined. They are certainly within the first 600 feet below land surface, and for most practical purposes are probably within the first 400 feet. The best producing wells in the Brunswick Formation in

Essex County are for the most part between 300 and 400 feet deep. Nevertheless, the lack of any precise known boundaries makes it difficult to determine the optimum depth to which a well should be drilled in any given location. Also it is impossible to predict the yield of a proposed well except in very general terms based on the average yield of other wells in the area.

Two pumping tests, both at the same locality, were conducted by the U. S. Geological Survey in January 1949 on wells tapping the Brunswick Formation in Essex County. The wells (owned by P. Ballantine and Sons, Newark), shown on figure 5, were selected to provide the best possible spread of observation wells in as many directions as possible. As the results of the tests have been reported by Herpers and Barksdale (1951, p. 28-31) they will be only summarized here.

In the first test, the centrally located well 1-1 was pumped and water levels were observed in the seven surrounding wells indicated on figure 5. Well 11-9 was pumped during the second test and the same wells were used to observe water levels. In both tests, observation wells lying along the strike of the Brunswick Formation with respect to the pumping well showed the greatest drawdown. When well 1-1 was pumped, there was a prompt and distinct decline of the water level in observation well 11-8. When well 11-9 was pumped, the water level in observation well 11-10 responded promptly and distinctly. No significant response was seen in observation wells aligned in directions other than along the strike during either test.

In these tests, as well as in several others conducted, it is invariably noted that aquifers in the sedimentary rocks of Triassic age of northern New Jersey are anisotropic, that is, they do not transmit water equally in all directions (Vecchioli, 1967). The greatest drawdowns are observed in those wells aligned along the strike of the sedimentary layers with respect to the pumping well. The least amount of drawdown is observed in observation wells that are located transverse to the strike. These observations have been interpreted to indicate that water moves more readily along joints and fractures which strike parallel to the strike of the bedding than along joints and fractures which strike in other directions. It is useful, when planning future well locations, to know the direction in which wells will interfere most with each other and with existing wells. In general, wells should be spaced far apart along the direction of strike (approximately N 30° E for most of Essex County) because it is in this direction that the greatest interference occurs. They may be placed closer together perpendicular to the strike since interference is less in that direction.

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ATTACHMENT F-7

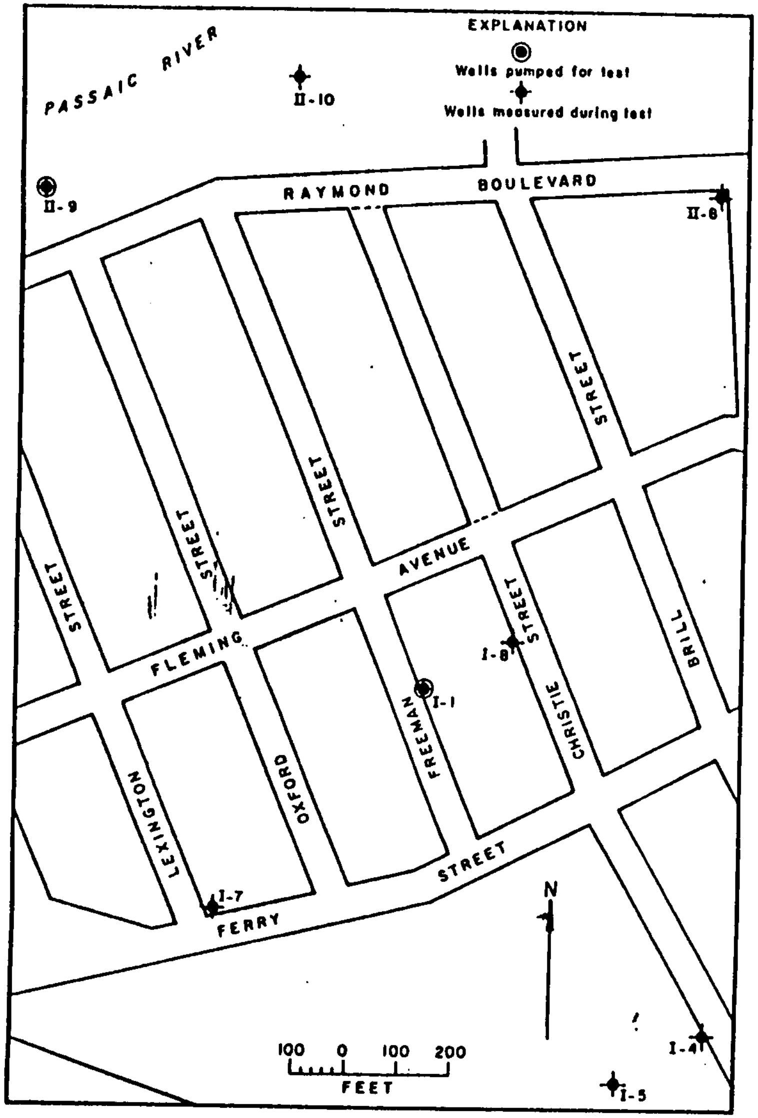

Figure 5.—Location of wells at plants of P. Ballantine and Sons, Newark, N. J., used during pumping tests in January 1949 (after Herpers and Barksdale, 1951, fig. 3, p. 30).

Well Yield and Specific Capacity

Yields of 35 large diameter public-supply, industrial, and commercial wells tapping the Brunswick Formation range from 35 to 820 gpm (gallons per minute) (Table 2) and average 364 gpm. The distribution of the yields is as follows:

Yields	*No. of wells*
0-150	4
151-300	12
301-500	12
>500	7

Depths of the same wells in the Brunswick Formation range from 115 to 856 feet; the average depth is 381 feet. Specific capacities of the 35 wells range from 0.21 to 70.00 gpm per foot of drawdown and average 11.07 gpm per foot of drawdown.

Wells tapping the Watchung Basalt commonly produce small to moderate quantities of water. Yields of 26 wells range from 7 to 400 gpm (Table 2) and average 116 gpm. The distribution of the yields is as follows:

Yields	*No. of wells*
0-100	15
100-199	5
200-300	5
>300	1

Specific capacities of wells in the basalt range from 0.05 to 5.66 gpm per foot of drawdown and average 1.74 gpm per foot of drawdown. Several moderate to high yielding public supply and industrial wells have been developed in the Essex Fells-West Caldwell-Fairfield area. These higher yields may be the result of increased fracturing of the basalt which has been slightly folded in this area.

Figures 6, 7, and 8 are specific capacity cumulative frequency distribution graphs for wells in the Brunswick Formation in Essex County. In figure 6, specific capacities are grouped on the basis of well depth. Wells drilled between 300 and 399 feet deep appear to have consistently higher specific capacities than wells of other depths (fig. 6). This relationship suggests that the best water-bearing zones in the Brunswick Formation will be

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ATTACHMENT F-3

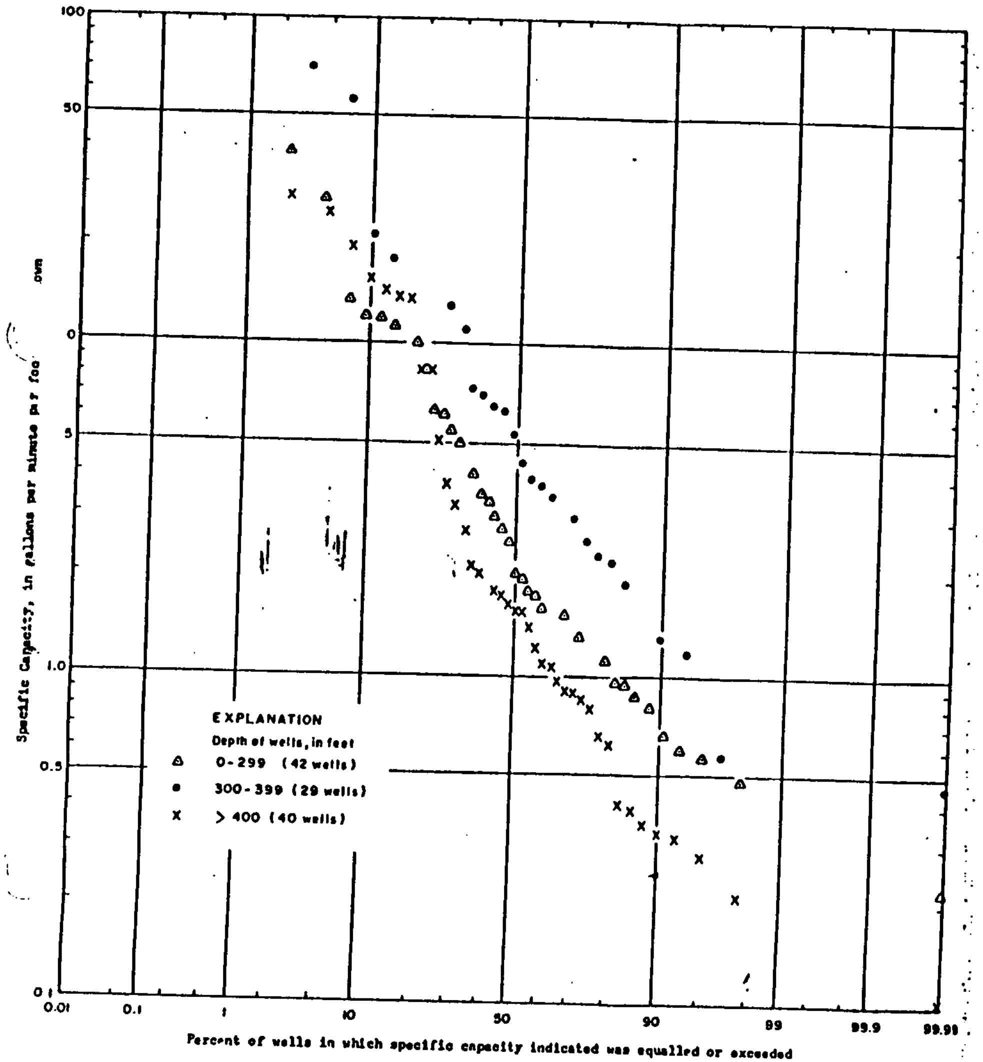

Figure 6.—Cumulative frequency distribution of specific capacities of wells penetrating the Brunswick Formation grouped according to depth.

encountered between depths of 300 and 400 feet and that significantly greater quantities of water generally will not be obtained by drilling below 400 feet. The specific capacities of wells grouped according to geographic area are shown in figure 7. These areas divide Essex County into three strips which are approximately parallel to the strike of the Brunswick Formation. The eastern strip is further divided into a northern part covering Belleville, Bloomfield, Glen Ridge, and Nutley, and a southern part covering East Orange, Irvington, and Newark. From this graph it readily can be seen that wells in Maplewood, Montclair, Orange, South Orange, and West Orange, have generally higher specific capacities than wells in other parts of Essex County. The wells in these communities are located in the area immediately east of First Watchung Mountain. In figure 8, specific capacities are related to well diameter. As should be expected, larger diameter wells have higher specific capacities.

Quality of Water

Except for hardness-forming constituents and local salt-water contamination, water from the Triassic rocks commonly does not contain objectional concentrations of any chemical constituents throughout most of the county (Table 3). The hardness of water ranges from 104 ppm (parts per million) to 273 ppm. In the Newark area, salt-water contamination has seriously impaired the quality of ground water and chloride concentration are as high as 1,900 ppm.

Ground water has high chloride concentrations in areas of relatively heavy pumpage in eastern Newark adjacent to Newark Bay and the Passaic River. By 1900, water levels in these areas, notably in the southeastern section, were considerably below sea level (fig. 9). The major pattern of ground-water development had changed slightly by 1960. More significant however is the extent to which water levels had been lowered below sea level and the increase in the size of the area affected by 1960 (fig. 10). Heavy ground-water withdrawals have lowered the general water level in these areas (fig. 10), reversing the natural gradient between the ground- and surface-water bodies, and have induced a flow of salt water from the river and bay into the underlying water-bearing formations. A water sample collected in 1879 from a well owned by the Celluloid Works, located in this part of Newark, contained only 6.2 ppm chloride. In 1948, water with 1,900 ppm chloride was collected from a well in the same area owned by P. Ballantine and Sons. A probable contributing factor in salt-water intrusion is the dredging of ship canals in Newark Bay and the Passaic River. In deepening these canals, semipervious Recent and Pleistocene sediments were removed which had acted as an imperfect barrier to the infiltration of salt water.

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ATTACHMENT E-4

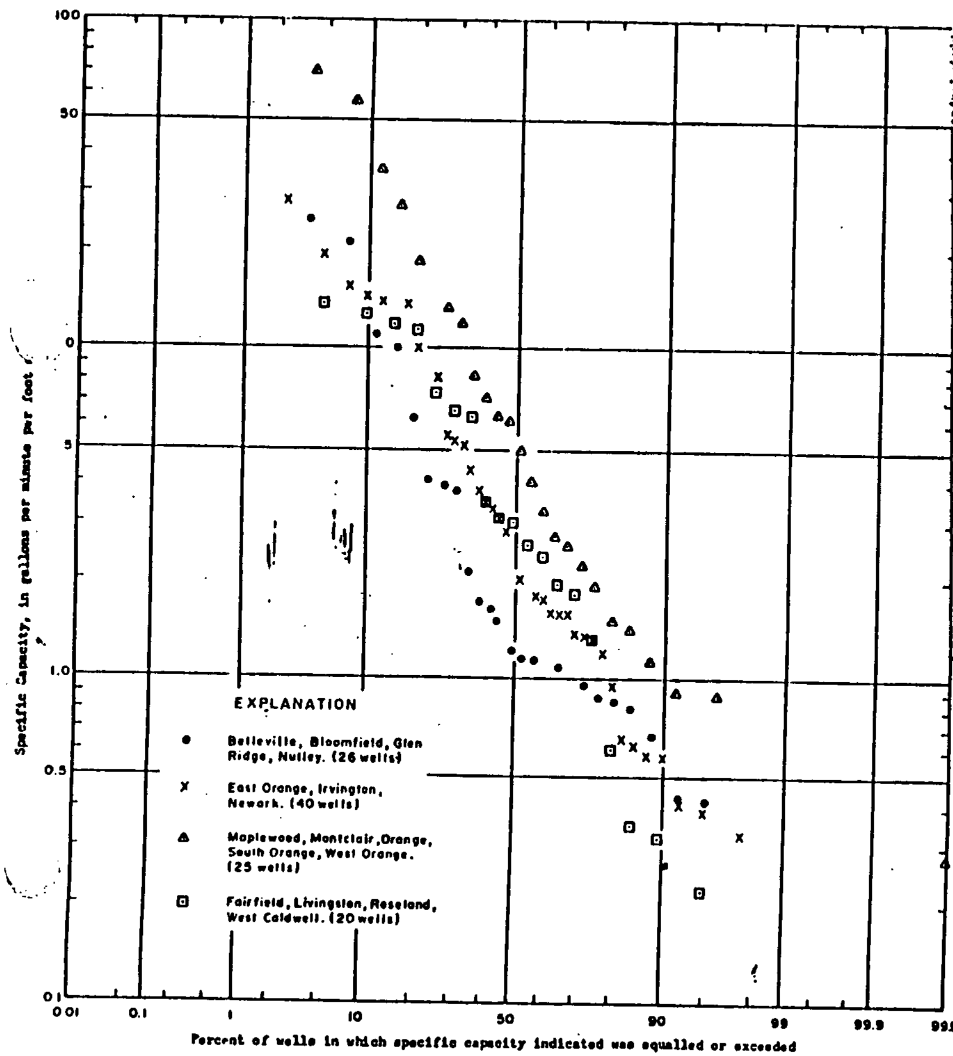


Figure 7.—Cumulative frequency distribution of specific capacities of wells penetrating the Brunswick Formation grouped according to geographic area.

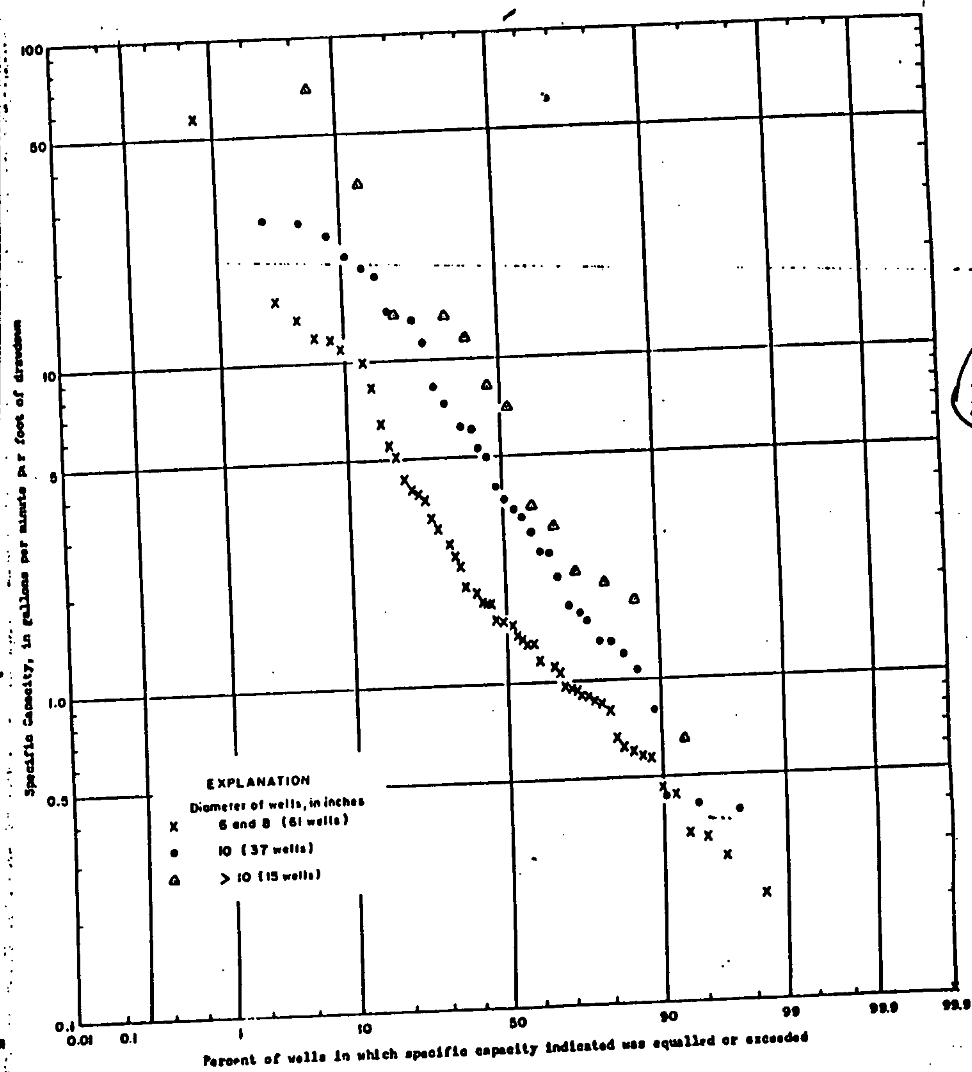


Figure 8.—Cumulative frequency distribution of specific capacities of wells penetrating the Brunswick Formation grouped according to well diameter.

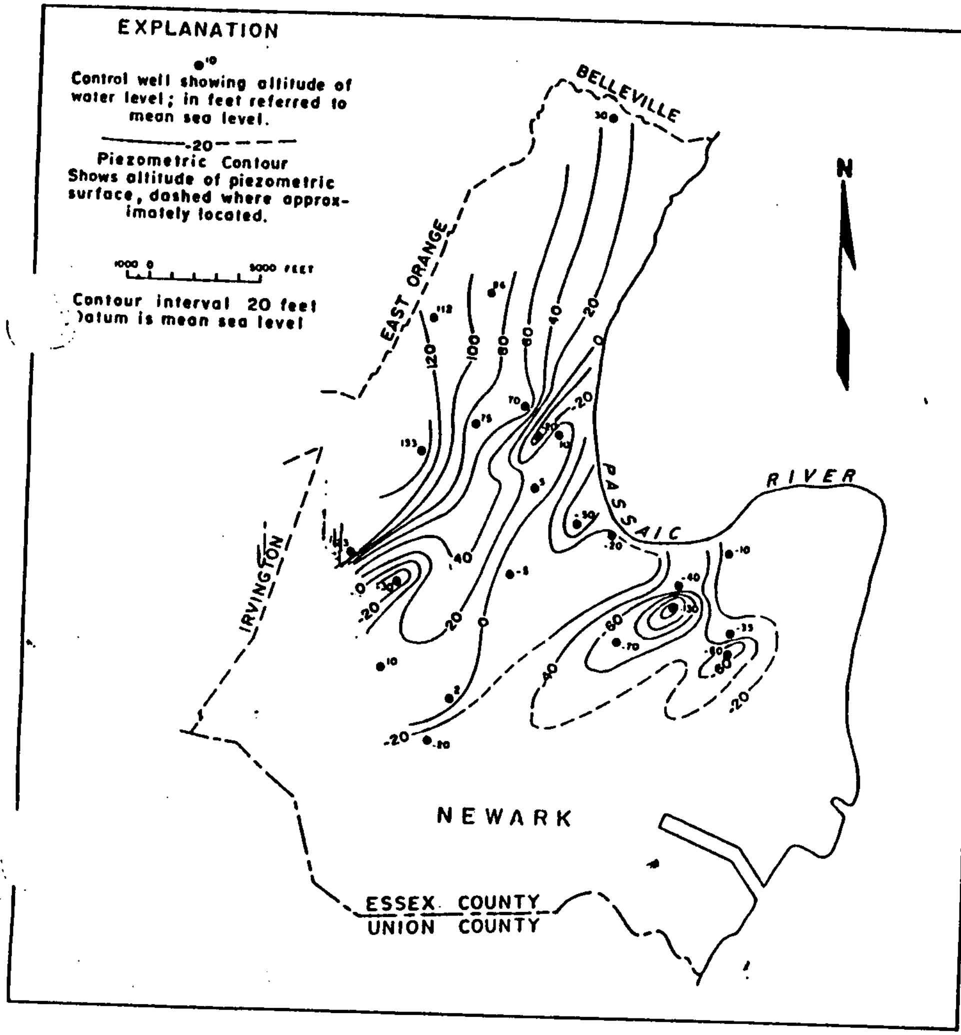


Figure 9.—Generalized piezometric contours for the Brunswick Formation in the Newark area based on water levels in wells drilled between 1890 and 1900.

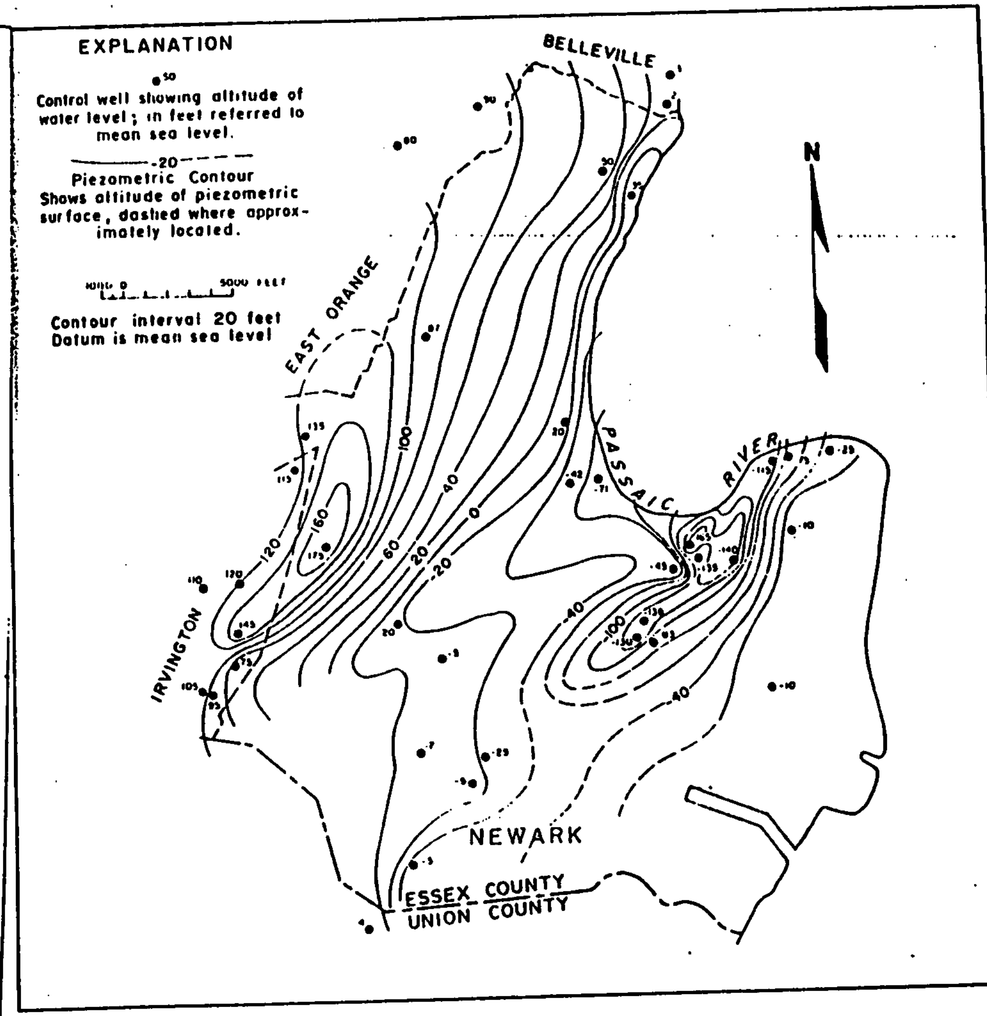


Figure 10.—Generalized piezometric contours for the Brunswick Formation in the Newark area based on water levels in wells drilled between 1950 and 1960.

ATTACHMENT

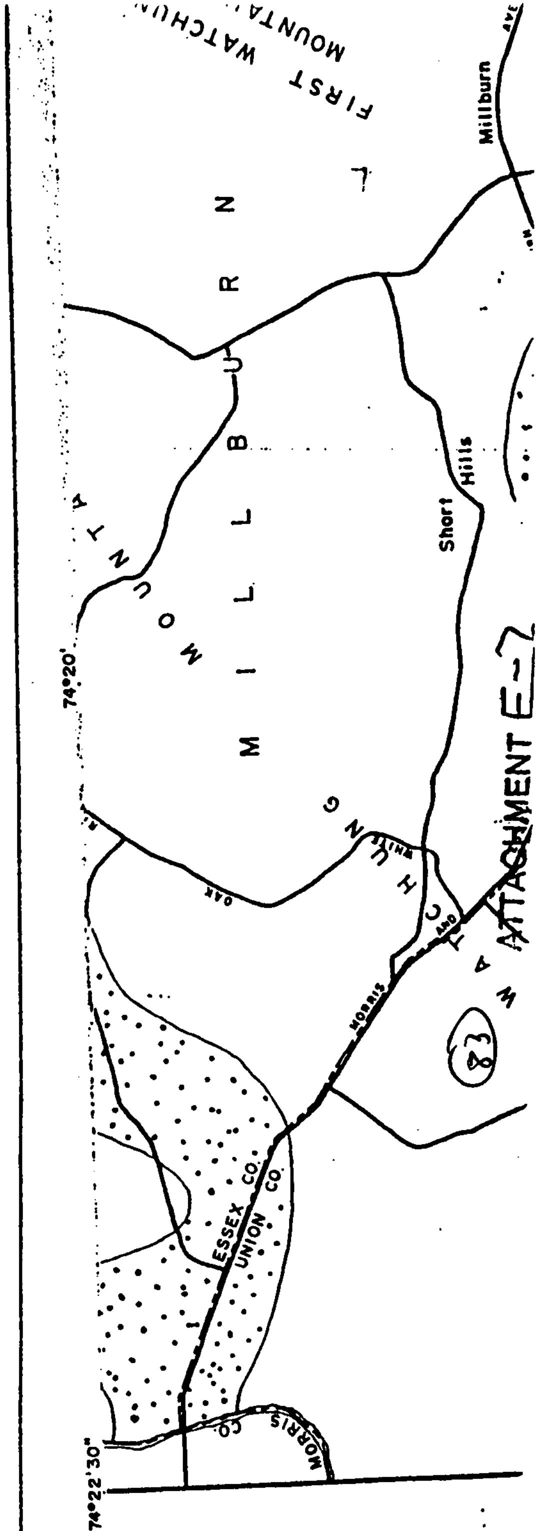
Salt-water contamination of the Brunswick Formation in the Newark area has been investigated by Herpers and Barksdale (1951). Their study was based on analyses of water samples collected in 1942 by the city of Newark. More recent analyses suggest there has been additional encroachment of saline water since 1942 throughout the problem area. In 1942, water from the Wilbur Driver Company's well No. 2 along the Passaic River in northern Newark contained 72 ppm chloride. In 1961, water from this same well contained 330 ppm chloride. Water from a well drilled by Mutual Benefit Life Insurance Company, 520 Broad Street, in 1965 contained 1,145 ppm chloride. Samples collected from other wells in this area contained less than 500 ppm chloride in 1942.

Pleistocene Deposits

Unconsolidated sediments of Pleistocene age mantle the bedrock throughout much of Essex County (fig. 3). They consist of clay, silt, sand, gravel, and boulders and can be divided into two general categories—stratified drift and unstratified drift. Only sand and gravel aquifers in stratified drift deposits contain sufficient quantities of water to warrant discussion of their water-bearing properties.

Water in the stratified drift occurs under both unconfined (water table) and confined (artesian) conditions. Unconfined ground water occurs where sand and gravel deposits are not covered by clay, silt, or glacial till and are exposed at the surface. The distribution of these deposits is shown on figure 3. For the most part however, these sand and gravel deposits do not yield large quantities of water as they are commonly less than 20 feet thick and are not areally extensive. The unconfined aquifers are recharged directly from precipitation on the outcrop area. Confined and semiconfined ground water occurs where sand and gravel deposits have been covered by lake clay or silt, or by glacial till. These deposits are largely confined to the buried valley so they are not visible on the surface and their regional extent and distribution are therefore not readily apparent. The confined and semiconfined aquifers are recharged by leakage through overlying confining beds and by precipitation falling on outcrop areas outside Essex County. Some recharge may also be derived from the underlying and adjacent Brunswick Formation.

The most productive artesian and semi-artesian aquifers in the stratified drift in Essex County occur as valley fill in stream valleys that were cut in the bedrock before the last glaciation. Consequently the size, shape, and distribution of the aquifers conform to the size, shape, and distribution of the bedrock valleys. The bedrock valley underlying the Newark area (shown on fig. 4) is filled with till and clay, and contains only minor amounts of water-bearing sand. Extensive subsurface exploration in western



Essex and eastern Morris Counties has demonstrated that the valley-fill aquifers in Essex County are part of an extensive valley-fill aquifer system underlying much of these two counties (Vecchioli and others, 1968). Figure 11 shows the known distribution of valley-fill aquifers in western Essex County.

The most highly developed part of the valley-fill aquifer system is in western Millburn and southwestern Livingston. Four well fields tapping the Pleistocene sand and gravel are located in an area of less than 4 square miles. During 1965 an average of 13.6 mgd (million gallons per day) was pumped from these fields. Such continued heavy development has, naturally, lowered water levels in the aquifer. In 1925, the depth to water in the Canoe Brook well field of Commonwealth Water Company was about 30 feet below land surface. By 1965, the average depth to water in the same field had dropped to 83.5 feet below land surface.

Figure 12 shows the annual mean depth to water in the Commonwealth Water Company's Canoe Brook well field for the 20-year period 1947 to 1966. The water level has declined almost continuously since 1947. This is due in large part to increased demands placed on the adjacent Canoe Brook well fields of the Commonwealth Water Co. and East Orange Water Dept. for most of the period 1947 to 1961. Commonwealth Water Company's Passaic River well field was put into service in 1956 and although the demands on their Canoe Brook field were lessened, the combined pumpage (not shown) continued to increase. However, in spite of the fact that from 1961 to 1966 pumpage from the Commonwealth and East Orange Canoe Brook fields decreased, the water level in the Commonwealth Canoe Brook field continued to decline (fig. 12). Several factors probably have caused this continuing lowering of water level. The Passaic River well field taps the same aquifer and withdrawals there have undoubtedly had some effect on area water levels. In addition, Commonwealth's Canoe Brook well field area has had below average rainfall for 12 of the 13 years since 1953 with a consequent reduction in the amount of available recharge. The reduction in recharge together with increased demands during extended dry periods, especially from 1961 to 1966, have contributed to the steady decline of the water level in the aquifer.

Aquifer tests on the stratified drift deposits have been conducted by the U. S. Geological Survey at two localities in Essex County and at several places in Morris County. The reliability of the results of these tests are questionable for the following reasons: (1) the aquifers are not areally extensive; (2) it is impossible to control or eliminate outside interference; (3) it is seldom possible to establish pre-test water-level

ATTACHMENT F-8

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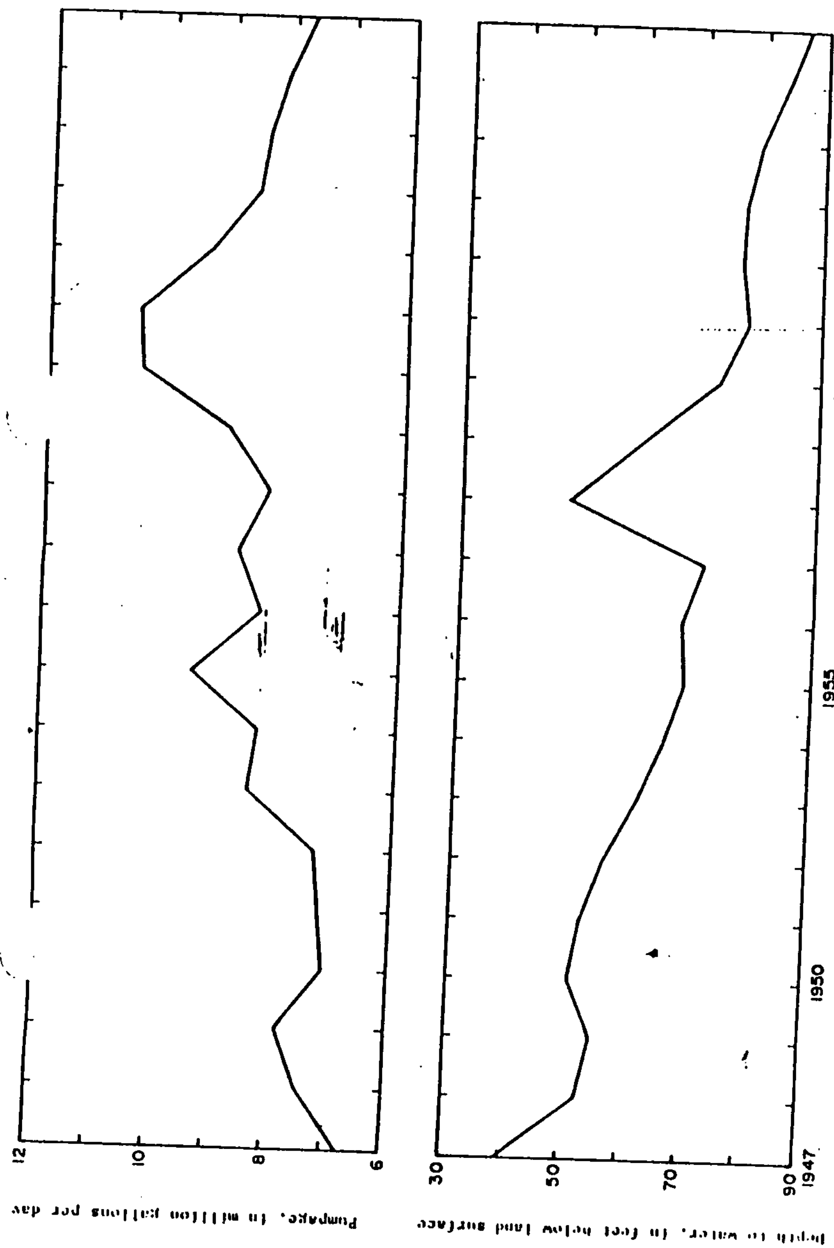

Figure 12.—Depth to water in the Commonwealth Water Company Canoe Brook well field and ground-water pumpage from the Commonwealth Water Company and East Orange Water Dept. Canoe Brook field

trends; and (4) observation wells commonly are insufficient in number or not properly located. It is therefore difficult to apply average figures for permeability, transmissivity, and the coefficient of storage to the valley fill aquifer and then use these figures to determine long-range effects of pumpage throughout the aquifer system Each area must be evaluated in context with the numerous variables by which it is affected.

Stratified drift deposits are the most productive aquifers in Essex County. Yields of 27 large-diameter wells tapping these deposits range from 410 gpm to 1,593 gpm (table 2) and average 908 gpm. The distribution of the well yields is as follows:

Yields	*No. of wells*
<500-gpm	3
501- 800 gpm	11
801-1,200 gpm	9
>1,200 gpm	4

Water from the stratified drift deposits ranges in hardness from 104 ppm to 212 ppm (table 3). Most of the samples analyzed had sulfate concentrations of 40 ppm or less, chloride concentrations of less than 11 ppm, and nitrate concentrations of 3 ppm or less. However, water from one well in Essex Fells had chloride and nitrate concentrations of 28 ppm and 6.4 ppm, respectively, and water from two wells in Millburn had sulfate concentrations of 67 ppm and 77 ppm. The higher concentrations of these constituents suggests a low-grade pollution problem, probably resulting from either sewage or the use of chemical fertilizers in the area. Manganese concentrations slightly in excess of the Public Health Service's recommended maximum limit of 0.05 ppm occur locally in the Commonwealth well field.

ATTACHMENT E-9

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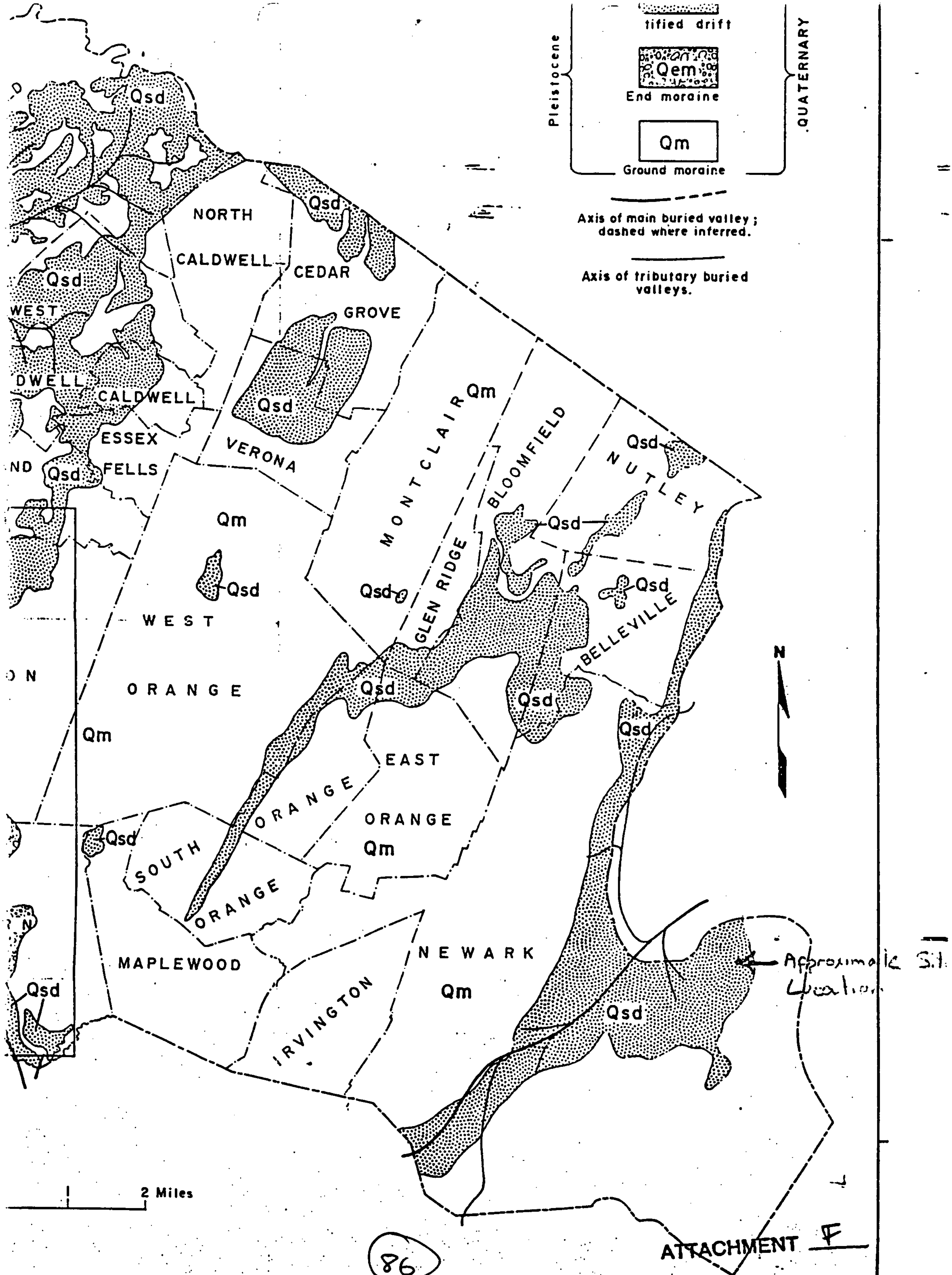

ATTACHMENT F

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
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Michele M. Putnam
Deputy Director
Hazardous Waste Operations

Lance R. Miller
Deputy Director
Responsible Party Remedial Action

M E M O R A N D U M

TO: Richard Gervasio, Supervisory Environmental Technician
Bureau of Planning and Assessment

FROM: Robert Beretsky, HSMS III CB
Bureau of Planning and Assessment

DEC 14 1988

SUBJECT: SAMPLING PLAN FOR THE HUMMEL CHEMICAL
(AKA: 185 FOUNDRY STREET) SITE

PROPOSED DATE OF SAMPLING: October 14, 1988

PURPOSE:
To characterize contaminants present at the site and determine the hazards these contaminants pose to public health and the environment.

COMMENTS:
The Hummel Chemical Company formerly processed a variety of chemicals at a small industrial complex located at 185 Foundry Street in Newark from the mid-1950's to the mid-1960's. Although the exact nature of Hummel's operations at the Foundry Street site are unknown, it appears most of the processing occurred through mixing and blending of powdered chemicals. Some of the chemicals reportedly used by Hummel are considered Class III Dioxin precursors. It is unknown exactly what building(s) Hummel may have occupied at the Foundry Street complex.

The Foundry Street complex is comprised of approximately 30 buildings, many of which currently and formerly housed chemical related industries. Former operators at this site include the Arkansas Chemical Company, Coronet Chemical Company, Diamond Shamrock, Essex Chemical Company, and Honig Chemical. Current occupants include the Sun Chemical Company, Conus Chemical, Avon Drum and Automatic Electroplating.

Most of the buildings are in close proximity, separated only by small alleyways. The alleyways throughout the site are bisected by common storm drains which receive contaminated runoff and, in some instances, direct discharges from the various industries. Samples collected from one, of the storm drains near the Sun Chemical Company as part of Sun Chemicals ECRA submittal revealed high concentrations of volatile organics. Since the storm drains are common to all the industries and due to the long history of industrial use at this site, it is difficult to assess which industries are the actual contributors to contamination in the drains.

Although most of the site is covered with concrete or asphalt, there are many exposed surfaces which are stained from spills and leaks of chemicals. Much of the "covered" areas are cracked or consist only of cobblestone thereby permitting any spills to migrate to the soil.

A presampling assessment conducted by NJDEP personnel on October 7, 1988 revealed most of the exposed soil surface is stained and appears to be saturated with chemicals. Pools of multi-colored chemicals were observed in many areas throughout the site. Poor housekeeping practices appear to be commonplace by almost all industries within the complex. Drums of hazardous substances were being stored throughout the site in insecure areas which lacked adequate secondary containment. Many of the drums were leaking and insecure.

Soil gas readings were recorded throughout the site using an HNu photoionization detector and an OVA flame ionization detector. Readings obtained on the HNu ranged from background (0.6 ppm as benzene) to over 600 ppm as benzene; those on the OVA ranged from 10 ppm as methane to over 1000 ppm as methane. Ambient air readings ranged from background to 40 on the HNu and from background to over 10 on the OVA.

Based on information obtained during the presampling assessment, further investigation of the site is warranted. Since the exact location of Hummel Chemical within the Foundry Street Complex cannot be discerned and due to the close proximity of the various industries to one another, the entire complex will be treated as one site.

SECTION A: QA/QC SAMPLES:
One trip blank to be analyzed for volatile organic chemicals and one field blank to be analyzed for substances included on the Hazardous Substance List + 30 peaks (HSL + 30) will be prepared for QA/QC purposes.

The trip blank will be filled with demonstrated analyte free water at Weston Labs prior to shipment to the Bureau of Planning and Assessment and will not be opened until it arrives back at the lab with the other samples. This sample will serve as a quality control to ensure contaminants are not being transfered between containers during shipment, nor occurring as a result of laboratory contamination.

The field blank will be prepared by pouring demonstrated analyte free water through a lab cleaned teflon bailor into sample bottles provided by Weston Labs. This sample serves as a quality control of the sample collection procedures and the equipment cleaning process ensuring contaminants are not being transferred to the sample via the sample collection equipment.

A Performance Evaluation (PE) dioxin sample will be obtained from the NJDEP/Bureau of Environmental Laboratories and shipped to Weston Analytical Laboratories with the dioxin samples collected on site. This sample will be used to determine the proficiency of the labs analytical procedures for dioxin analysis.

Lastly, a total of four additional environmental samples will be collected, two for each environmental media sampled (soil/sediment and water), and will be used as Matrix Spike and Matrix Spike Duplicate samples for lab QA/QC purposes. These samples will be collected from the soil 2 and surface water 1 locations and analyzed for the HSL + 30.

ATTACHMENT G

SECTION B: AQUEOUS SAMPLES:
A total of six aqueous samples (excluding MS spike samples), including two monitor well samples and four surface water samples will be collected during the site inspection.

The two monitor well samples will be collected from wells located on the former Hummel-Lanolin property (not related to Hummel Chemical) near the northern corner of the Foundry Street Complex. Three to five times the volume of water in each well will be evacuated from the well before sampling is initiated. Centrifugal pumps with dedicated polyethylene tubing will be used to pump each well. Samples will be collected using dedicated teflon bailors and nylon string. All samples will be analyzed for the HSL + 30.

The four surface water samples will be collected from locations SW-1 through SW-4 as labelled on the attached map. These samples will be collected from the on site drainage system, and will be analyzed for the HSL + 30.

SECTION C: SOIL/SEDIMENT SAMPLES:
A total of fifteen soil samples and five sediment samples (excluding the MS spike samples) will be collected during the site inspection. Fourteen of the soil samples will be collected from locations SOIL-1 through SOIL-14 as labelled on the attached map and analyzed for the HSL + 30. All of these samples will be collected at a depth of 0 to 6 inches, with the exception of sample SOIL-3 which will be collected at a depth of 4 to 4.5 feet, and SOIL-4 which will be collected at a depth of 1.0 to 1.5 feet. Three soil samples will be collected from locations SOIL DIOX-1 through SOIL DIOX-3 as labelled on the attached map, and analyzed for the 2,3,7,8 TCDD dioxin isomer. These samples will be collected at a depth of 0 to 6 inches. Two soil samples, SOIL-15 and SOIL DIOX-4, will be collected from an offsite location to be determined on the date of sampling and will be analyzed for HSL + 30 and the 2,3,7,8 TCDD dioxin isomer, respectively. Both samples will be collected at a depth of 0 to 6 inches and serve as indicators of background soil conditions.

The five sediment samples will be collected from locations SED-1 through SED-5 as labelled on the map. These samples will be analyzed for the HSL + 30.

All soil/sediment samples will be collected using lab cleaned and dedicated stainless steel bucket augers will be utilized when necessary.

SECTION D: PROCEDURES AND EQUIPMENT:
Lab cleaned and dedicated teflon bailors will be used to collect samples from the two monitor wells. Three to five times the volume of water in each well will be evacuated from the well before sampling is initiated. Centrifugal pumps with dedicated polyethylene tubing will be used to purge both wells.

Lab cleaned and dedicated stainless steel trowels will be used to collect all soil and sediment samples. Lab cleaned and dedicated stainless steel bucket augers will be used as necessary to assist in sample collection.

NJDEP sampling procedures and protocol will be followed at all times.

SECTION E: COSTS:

WESTON LABORATORY PRICES:

	ANALYSIS	COST EACH	TOTAL COST
20 Soil/Sediment Samples	HSL + 30	$1,725.00	$34,500.00
2 Groundwater Samples	HSL + 30	$1,600.00	$ 3,200.00
4 Surface Water Samples	HSL + 30	$1,600.00	$ 6,400.00
5 Soil Samples	2,3,7,8 TCDD	$ 450.00	$ 2,250.00
1 Field Blank	HSL + 30	$1,600.00	$1,600.00
1 Trip Blank	VOA	$ 400.00	$ 400.00
			$48,350.00

SECTION F: SHIPPING AND HANDLING:
Samples will chain of custody sealed in coolers provided by Weston Laboratories and shipped back to Weston via Federal Express (overnight). Weston's Federal Express No. is 0191-1273-0. Samples will be kept at 4°C at all times.

SECTION G: RECOMMENDATIONS:
Due to the potential for dioxin contamination within the buildings formerly occupied by the Hummel Chemical Company and the Diamond Shamrock Corporation, additional sampling inside the buildings is necessary. These samples may include wipe, chip and possibly air samples collected at strategic locations such as old exhaust fans, floors, window panes, trusses, etc.

All actions undertaken at the site will be coordinated with the NJDEP/Division of Hazardous Waste Management/Metro Field Office.

Further recommendations will be based on review of the samples analyses from the 10/14/88 site inspection.

RB:mz

ATTACHMENT G

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michele M. Putnam
Deputy Director
Hazardous Waste Operations

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CN 028
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(609)633-1408

Lance R. Miller
Deputy Director
Responsible Party Remedial Action

M E M O R A N D U M

MAR 15 1989

TO: Richard Gervasio, Supervising Environmental Technician
Bureau of Planning and Assessment

FROM: Robert Beretsky, HSMS III RB
Bureau of Planning and Assessment

SUBJECT: SAMPLING EPISODE REPORT FOR THE HUMMEL CHEMICAL (AKA: FOUNDRY STREET) SITE

PURPOSE:
To outline sampling activities conducted by Bureau of Planning and Assessment personnel at the subject site.

NJDEP REPRESENTATIVES:
RICHARD GERVASIO, SUPERVISORY ENVIRONMENTAL TECHNICIAN
CLARE SULLIVAN, HSMS III
EDWARD GAVEN, HSMS III
DAVID VAN ECK, HSMS III
ROBERT RAISCH, HSMS III
CHRISTINA HOLSTROM, HSMS III
FRANK SORCE, HSMS IV
ROBERT BERETSKY, HSMS III

DATE OF SAMPLING: October 14, 1988

DATE OF REPORT: October 26, 1988

COMMENTS:
The Hummel Chemical Company formerly processed a variety of chemicals from a small industrial complex located at 185 Foundary Street in Newark from the mid 1950's to the mid 1960's. Although the exact nature of Hummels operations at the Foundry Street site are unknown, it appears most of the processing occured through mixing and blending of powered chemicals. Some of the chemicals reportedly used by Hummel are considered Class III Dioxins precursors. It is unknown exactly what building(s) Hummel may have occupied at the Foundry Street complex.

The entire Foundry Street complex has a long history of occupancy by a variety of chemical related industries dating back to at least 1931. In the early 1930s, the site was utilized by H.A. Metz Laboratories for the manufacture of drugs (not specified). According to the Sandborne Fire Insurance maps for 1931, many of buildings occupied by H.A. Metz were used as labs. Also at this time, the northeastern portion of the property was undeveloped.

In the 1950s at least two industries, Chemical Industries Inc. and the Arkansas Chemical Company, occupied the site. Arkansas, located at the extreme southern portion of the site, manufactured textile related chemicals until approximately 1982. The type of operations undertaken by Chemical Industries Inc. is unknown but it is believed they may have leased some buildings to other chemical companies. Many of the buildings were again labeled for laboratory use on the 1950 Sandborne Map.

Currently, the Foundry Street Complex is comprised of approximately 30 buildings, many of which still house chemical related industries. These industries include the Sun Chemical Company, Conus Chemical Company, Avon Drum Company and Automatic Electroplating.

Most of the buildings are in close proximity separated only by small alleyways. The alleyways throughout the site are bisected by common storm drains which receive contaminated runoff and in some instances, direct discharges from the various industries. Samples collected from one of the storm drains near the Sun Chemical Company as part of Sun Chemical's ECRA submittal revealed high concentrations of volatile organics. Since the storm drains are common to all of the industries and due to the long history of industrial use at the site, it is difficult to assess which industries are the actual contributors to contamination in the drains.

Most of the site is covered with concrete, asphalt, and/or buildings, but many exposed surfaces are stained from apparent releases of chemicals. Also many of the "covered" areas are cracked or consist only of cobblestone, thereby permitting any releases to easily migrate to the soil.

A presampling assessment conducted by NJDEP personnel on October 7, 1988 revealed most of the exposed soil surface is stained and appears to be saturated with chemicals. Pools of multicolored chemicals were observed in many areas around the site, especially near Conus Chemical. Poor housekeeping practices appear to be commonplace by almost all of the industries within the complex. Drums of hazardous substances were being stored throughout the site in insecure areas which lacked adequate secondary containment. Many of the drums were leaking and in poor condition.

During the presampling assessment, soil gas readings were obtained throughout the site using an HNu photoionizer and an OVA flame ionizer in the survey mode. Readings obtained on the HNu ranged from background (0.6 ppm as benzene) to over 600 ppm; those on the OVA ranged from 10 ppm as methane to over 1000 ppm. Ambient air readings ranged from background (1.0 ppm) to over 10 ppm on the OVA.

Based on information obtained during the presampling assessment, further investigation was deemed necessary.

Scheduled for sampling on 10/14/88 were eighteen soil samples, five sediment samples, four surface water samples and two groundwater samples. All of the samples, with the exception of four soil samples, are to be

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sampled for the Hazardous Substance List + 30 peaks. The other four soil samples are to be analyzed for the 2, 3, 7, 8 TCDD dioxin isomer.

It should be noted corrective actions were needed at several sample locations and will be discussed in the sections pertaining to these samples.

SAMPLING EPISODE: Weather: sunny; 55°F

0720:
Richard Gervasio, Edward Gaven, David Van Eck, Frank Sorce and Robert Beretsky arrive on site.

0725:
Clare Sullivan, Robert Raisch and Christina Holstrom arrive on site.

0830:
All shuttle seals are broken by Richard Gervasio and Robert Beretsky (See pages 9-15 for sample numbers and corresponding seal numbers).

0830-0840:
Sampling team sets up decontamination line along northern portion of site near Conus Chemical.

0840-0850:
Robert Beretsky escorts sampling team around site to exhibit the sample locations.

0855-0920:
David Van Eck and Frank Sorce collect Soil 2 (BSA10148467) from behind a warehouse associated with the Arkansas Chemical Company operations (Soil 2 as labeled on attached map). The sample was obtained at a depth of 6 to 12 inches below grade and was described as dark brown to black sand and gravel. The sample location was photographed.

0900-0905:
Edward Gaven and Robert Raisch obtain Soil 10 (BSA10148475) from the eastern side of the Avon Drum Company yard area (Soil 10 as labeled on attached map). The sample was described as dark brown silty sand and clay mixed with black fill material. The sample was collected at a depth of 0 to 6 inches. A photograph was taken of the sample location.

0900-0905:
Sediment 3 (BSA10148483) is collected by Clare Sullivan and Christina Holstrom from the storm drain located in the alleyway between the four story building formerly associated with Arkansas Chemical Company and the current Automatic Electroplating Company Building #22 (Sediment 3 as labeled on attached map). The sample is obtained at a depth of 0 to 6 inches and is described as black tarry soil. The sample location was photographed by NJDEP/DHWM/BPA personnel.

0915-0925:
Clare Sullivan and Christina Holstrom obtain Sediment 2 (BSA10148476) from the drainage ditch reportedly emenating from Sun Chemical's wastewater treatment system (SED 2 as labelled on map). The sample was collected at a depth of 0 to 6 inches and was described as purple sandy sediment

intermixed with small pebbles. The sample location was photographed by NJDEP/DHWM/BPA personnel.

0925-0930:
Edward Gaven and Robert Raisch obtain Soil 11 (BSA10148476) from the yard area of the Avon Drum Company along the fenceline of Avon Drum and the former Hummel-Lamolin property (Soil 11 as labelled on attached map). The sample was taken at a depth of 6 to 8 inches and was described as dark brown to black silt and yellow brown clay. Readings of 10 to 20 ppm as methane were obtained on the OVA directly over the sample location. The sample location was changed from that proposed in the sampling plan (near the center of Avon Drum Companys' yard area) due to the very hard soil surface encountered at the proposed location. NJDEP/DHWM/BPA personnel photographed the sample location.

0930-0945:
Clare Sullivan and Christina Holstrom collect Soil 1 (BSA10148466) from near a drum storage area on the Sun Chemical site (Soil 1 as labeled on map). The sample was described as oil stained soil and was collected at a depth of 0 to 6 inches. The sample location was photographed by NJDEP/DHWM/BPA personnel.

0935-0940:
Edward Gaven and Robert Raisch obtain Soil 12 (BSA10148477) from the yard area of the Avon Drum Company near the northern fence line bordering Roanoke Avenue (Soil 12 as labeled on map). The sample was collected at a depth of 0 to 6 inches and was described as dark brown silty sand. The sample location was photographed by NJDEP/DHWM/BPA personnel.

0950-0955:
Soil 13 (BSA10148478) was collected by Edward Gaven and Robert Raisch along the northern fenceline of the Avon Drum Company yard area, directly west of soil location 12 (Soil 13 as labeled on map). The sample was collected at a depth of 0 to 6 inches and was described as dark brown to black soil and green-red clay. Readings ranging from 200 to 300 ppm as methane were recorded on the OVA over disturbed soil within the sample location. The sample location was photographed by NJDEP/DHWM/BPA personnel.

0950-1015:
David Van Eck and Frank Sorce collect Soil 3 (BSA10148468) from within the Soil 2 sample boring (Soil 3 as labeled on map). The sample was obtained at a depth of 1.5 to 2 feet below grade and was described as dark black oily sand and gravel. This sample was to be collected at a depth of 4 to 4.5 feet below grade, however due to the excessive amounts of gravel encountered, this depth could not be achieved. The sample location was photographed by NJDEP/DHWM/BPA personnel.

1010-1015:
Soil 14 (BSA10148479) is collected by Edward Gaven and Robert Raisch in the yard area of the Avon Drum Company, between rows of stacked drums (Soil 14 as labeled on map). The sample was described as black soil with a petroleum odor. A reading of 100 ppm as methane was recorded over disturbed soil within the sample location. The sample was collected at a depth of 0 to 6 inches. The sample location was photographed by NJDEP/DHWM/BPA personnel.

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<u>1015-1025</u>:
David Van Eck and Frank Sorce obtain Soil 4 (BSA10148469) at a depth of 6 to 8 inches below grade, directly beneath a pipe emenating from the former Arkansas Chemical Company warehouse (Soil 4 as labeled on map). The sample was described as brown sand. This sample location was also changed from that proposed in the sampling plan, as it was believed to be a more appropriate location by sampling team personnel. A photograph was taken of the sample location.

<u>1015-1025</u>:
Clare Sullivan and Christina Holstrom collect Surface Water 1 (BSA10148488) from the drainage ditch between the Sun Chemical (Building #23) and former Arkansas Chemical Company buildings (SW 1 as labeled on map). The sample was obtained from an active flow and is described as clear water with an oil sheen on the surface. The sample location was photographed by NJDEP/DHWM/BPA personnel.

<u>1030-1045</u>:
Soil 5 (BSA10148470) is obtained by David Van Eck and Frank Sorce from beneath one of the former Arkansas Chemical Company buildings in the southeastern corner of the site (Soil 5 on attached map). The sample is described as dark brown to black sand and gravel and is collected at a depth of 6 to 12 inches. The sample location is photographed by NJDEP/DHWM/BPA personnel.

<u>1040-1045</u>:
Clare Sullivan and Christina Holstrom obtain Sediment 1 (BSA10148481) from the drainage ditch between the Sun Chemical (building #23) and former Arkansas Chemical Company buildings (Sed. 1 as labeled on map). The sample was described as black grainy soil intermixed with pebbles. The sample was collected at a depth of 0 to 6 inches. The sample location was photographed by NJDEP/DHWM/BPA personnel.

<u>1040-1046</u>:
Richard Gervasio and Robert Beretsky obtain Soil 9 (BSA10148474) from the northern portion of the site near Conus Chemicals' drum storage area (Soil 9 as labeled on map). The sample was collected at a depth of 0 to 6 inches and was described as black oily soil. The sample location was photographed.

<u>1045-1050</u>:
Edward Gaven and Robert Raisch collect Dioxin 3 (BSA10148494) from within the yard area of the Avon Drum Company (Soil Diox 3 as labeled on map). It should be noted this location was not proposed in the sampling plan and Dioxin 3 was to be collected from behind the Arkansas Chemical Company warehouse near Soil Location 2. However, due to a mixup the sample Dioxin 3 was collected from the yard area of the Avon Drum Company and Dioxin 4 obtained from the proposed Dioxin 3 location behind the Arkansas warehouse. Dioxin 4 was initially designated as the background (offsite) dioxin sample.

The Dioxin 3 sample was described as dark brown silt with some clay and was collected at a depth of 0 to 6 inches. The sample location was photographed by NJDEP/DHWM/BPA personnel.

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<u>1055-1100</u>:
Richard Gervasio and Robert Beretsky collect Soil 8 (BSA10148473) from near Conus Chemicals' drum storage area, approximately 100'-120' southeast of the Soil 9 sample location (Soil 8 as labeled on map). The sample was collected at a depth of 0 to 6 inches and was described as dark black oil-stained soil. A photograph was taken of the sample location.

<u>1100-1115</u>:
Surface Water 3 (BSA10148490) was obtained by Clare Sullivan and Christina Holstrom from the drainage ditch directly behind Automatic Electroplating (building #22 - SW 3 as labeled on map). The water within this ditch appeared to be static at the time of the site inspection and was described as slightly cloudy, gray to brown water with an oil sheen on the surface. The sample was collected directly within the sample bottles. A photograph is taken of the sample location.

<u>1110-1115</u>:
Dioxin 4 (BSA10148495) is obtained by Edward Gaven and Robert Raisch behind the former Arkansas Chemical Company warehouse near Soil #2 (Soil Diox 4 as labeled on attached map). As was previously stated, Dioxin 4 was to be the background dioxin sample, and Dioxin 3 was to be collected behind the Arkansas warehouse, however, due to a mixup Dioxin 3 was collected in the yard area of the Avon Drum Company and Dioxin 4 was moved to behind the Arkansas warehouse. The sample was collected at a depth of 0 to 6 inches and was described as brown silt and clay. The sample location was photographed by NJDEP/DHWM/BPA personnel.

<u>1115-1120</u>:
Clare Sullivan and Christina Holstrom collect Sediment 4 (BSA10148484) from the drainage ditch located directly behind the Automatic Electroplating Building #22 (SED 4 as labeled on attached map). The sample was taken within the drainage ditch at a depth of 0 to 6 inches. The drainage ditch is approximately 1.5 feet below existing grade. The sample was described as black, grainy sediment intermixed with small pebbles. A photograph is taken of the sample location.

<u>1120-1125</u>:
Edward Gaven and Robert Raisch collect Dioxin 2 (BSA10148493) from between the Automatic Electroplating (Building #22) and the former Arkansas Chemical Company buildings (Soil Diox 2 as labeled on map). The sample was obtained by scraping soil from between cobblestones in the alleyway between the two buildings. The sample was described as loose sandy material. The sample location was photographed by NJDEP/DHWM/BPA personnel.

<u>1130-1135</u>:
Robert Raisch and Edward Gaven obtain Dioxin 1 (BSA10148492) from near the dumpster on the Sun Chemical site (Soil Diox 1 as labeled on attached map). The sample was described as brown to black silty clay with some purple coloration. The sample was collected at a depth of 0 to 6 inches. A photograph was taken of the sample location.

<u>1205-1215</u>:
Sediment 5 (BSA10148485) was collected by Clare Sullivan and Christina Holstrom from within the drainage ditch located between buildings currently occupied by RFE and Conus Chemical (SED 5 as labeled on map). The sample was collected at a depth of 0 to 6 inches and was described as grainy soil

with tan streaks. Standing water present in the drainage ditch was noted to have an oily sheen. The sample location was photographed by NJDEP/DHWM/BPA personnel.

1210-1215:
Edward Gaven and Robert Raish collect Surface Water 4 (BSA10148491) from a drainageway located between Automatic Electroplating (building #23) and CWC Industries (building #18-SW 4 as labeled on map). An active flow was noted in the drainageway during the site inspection. The sample was described as having oily sheen on the surface and possessing an undetermined odor. A photograph was taken of the sample location. This sample location was changed from that proposed in the sampling plan since there was no water in the proposed location at the time of the site inspection.

1215-1230:
Clare Sullivan and Christina Holstrom collect Soil 7 (BSA10148472) from just outside the demolished section of building formerly occupied by the Honig Chemical Company (Soil 7 as labeled on map). The sample was obtained at a depth of 0 to 6 inches and was described as dark brown sandy soil with yellow flecks. The yellow flecks somewhat resembled hexavalent chromium. The sample location was photographed by NJDEP/DHWM/BPA personnel.

1215-1230:
Richard Gervasio and David Van Eck collect groundwater samples from Monitor Wells 1 and 2 located on the former Hummel-Lanolin property. The wells were installed within 50 feet of one another near Hummel-Lanolins' former underground tank. These wells are also considered downgradient of the remainder of the 185 Foundry Street site.

Monitor Well 1 was hand bailed to dryness prior to sample collection. It was estimated 1 gallon of water was purged from the well. Due to the extremely slow recovery of the well only two 40 ml volatile organic bottles and one half of the one liter metals container were able to be filled. The sample was described as black water.

Monitor Well 2 was also hand bailed to dryness prior to sample collection. Here again, the well did not completely recover and only the two 40 ml volatile organic bottles and one half of the one liter metals container could be filled. The sample was described as black water. Both wells were photographed.

1230-1240:
Edward Gaven and Robert Raisch obtain Surface Water 2 (BSA10148489) from the drainage ditch located near Automatic Electroplating (Building #23), Fleet Autoelectric (Building #29), and CWC Industries (Building #18). This sample cooresponds to SW2 as labeled on the attached map. The sample was described as cloudy, standing water and was collected directly within the sample bottles. The sample location was photographed by NJDEP/DHWM/BPA personnel.

1230-1245:
Soil 15 (BSA10148480) is collected by Richard Gervasio and Robert Beretsky across Roanoke Avenue, north of Conus Chemical (Soil 15 on attached map). The sample was described as loose brown dirt and was collected at a depth of 0 to 6 inches. This sample is considered the background soil sample. A photograph is taken of the sample location.

1240-1245:
Clare Sullivan and Christina Holstrom collect Soil 6 (BSA10148471) from behind the former Arkansas Chemical Company buildings (Soil 6 on map). The sample is taken at a depth of 0 to 6 inches and is described as black to dark brown soil. A photograph was taken of the sample location.

1245-1300:
Richard Gervasio and Robert Beretsky decon sample team personnel.

1300-1330:
Clare Sullivan and Robert Beretsky complete chain of custody and sample analysis request forms.

1345-1400:
Samples are placed in appropriate shuttles and the shuttles sealed for shipment back to Weston Laboratories.

1400:
Clare Sullivan, Robert Raisch, Christina Holstrom, Edward Gaven, David Van Eck and Frank Sorce depart from site.

1415:
Richard Gervasio and Robert Beretsky depart from site.

1440:
Richard Gervasio and Robert Beretsky deliver sealed shuttles to the Federal Express Office. Four shuttles to be shipped to Weston Labs in Lionville, Pa. are assigned Airbill #289222500.

CONCLUSIONS:
All samples were collected in accordance with methedologies outlined in the NJDEP Sampling Procedures Manual.

Photographs taken during the site inspection are in the custody of the NJDEP/Division of Hazardous Waste Management/Bureau of Planning and Assessment.

RECOMMENDATIONS:
Due to the potential for dioxin contamination within the buildings formerly occupied by the Hummel Chemical Company and the Diamond Shamrock Corporation, additional dioxin sampling inside the buildings is necessary. These samples may include wipe, chip, and possibly air samples at strategic locations such as old exhaust fans, cracks/seams in floors, window panes, trusses, etc.

Additional sampling of the monitor wells is also recommended. Analysis of the samples should be for parameters not obtained during the October 14, 1988 site inspection. These parameters include the following HSL sample fractions; Acid Extractables/Base Neutrals, Pesticides/PCBs, and Metals (if sample collected on October 14, 1988 can not be analyzed). It is highly recommended petroleum hydrocarbon analysis also be performed on the groundwater samples.

Further recommendations will be based on review of analytical data generated from the October 14, 1988 site inspection.

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WESTON SAMPLES

SAMPLE #	SHUTTLE SEAL # UPON ARRIVAL AT BPA OFFICE	SHUTTLE RESEAL # FOR SHIPMENT BACK TO WESTON LABS	LOCATION	ANALYSIS	COST EACH
BSA10148473	SEE NOTE *	BSA10148-3	SOIL 8 ON MAP-NEAR DRUM STORAGE AT CONUS CHEMICAL.	HSL + 30	$1725.00
BSA10148474	SEE NOTE *	BSA10148-3	SOIL 9 ON MAP-NEAR DRUM STORAGE GATE AT CONUS CHEMICAL.	HSL + 30	$1725.00
BSA10148475	SEE NOTE *	BSA10148-3	SOIL 10 ON MAP-SOUTHEAST CORNER OF AVON DRUM.	HSL + 30	$1725.00
BSA10148476	SEE NOTE *	BSA10148-3	SOIL 11 ON MAP-WESTERN BORDER OF AVON DRUM, NEAR FENCELINE OF FORMER HUMMEL-LANOLIN PROPERTY.	HSL + 30	$1725.00
SA10148477	SEE NOTE *	BSA10148-3	SOIL 12 ON MAP-AVON DRUM CO. NEAR FENCE BORDERING ROANOKE AVE.	HSL + 30	$1725.00
BSA10148478	SEE NOTE *	BSA10148-3	SOIL 13 ON MAP- AVON DRUM CO. NEAR FENCE BORDERING ROANOKE AVE., WEST OF SOIL 12 LOCATION.	HSL + 30	$1725.00

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WESTON SAMPLES

SAMPLE #	SHUTTLE SEAL # UPON ARRIVAL AT BPA OFFICE	SHUTTLE RESEAL # FOR SHIPMENT BACK TO WESTON LABS	LOCATION	ANALYSIS	COST EACH
BSA10148479	SEE NOTE *	BSA10148-3	SOIL 14 ON MAP- AVON DRUM CO. BETWEEN ROWS OF STACKED DRUMS.	HSL + 30	$1725.00
BSA10148480	SEE NOTE *	BSA10148-3	SOIL 15 ON MAP-ACROSS ROANOKE AVE., NORTH OF CONUS CHEMICAL CO.-BACKGROUND.	HSL + 30	$1725.00
BSA10148481	SEE NOTE *	BSA10148-3	SED 1 ON MAP-DRAINAGE DITCH BETWEEN SUN CHEMICAL AND FORMER ARKANSAS CHEM. CO. BUILDINGS.	HSL + 30	$1725.00
BSA10148482	SEE NOTE *	BSA10148-3	SED 2 ON MAP-DRAINAGE FROM SUN CHEMICAL SITE REPORTEDLY LEADING TO PVSC.	HSL + 30	$1725.00
BSA10148483	SEE NOTE *	BSA10148-3	SED 3 ON MAP-DRAINAGE DITCH BETWEEN AUTOMATIC ELECTROPLATING & FORMER ARKANSAS CHEMICAL CO. BUILDINGS.	HSL + 30	$1725.00
BSA10148484	SEE NOTE *	BSA10148-3	SED 4 ON MAP-DRAINAGE DITCH BEHIND AUTOMATIC ELECTROPLATING.	HSL + 30	$1725.00

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SAMPLE #	SHUTTLE SEAL # UPON ARRIVAL AT BPA OFFICE	SHUTTLE RESEAL # FOR SHIPMENT BACK TO WESTON LABS	LOCATION	ANALYSIS	COST EACH
BSA10148485	SEE NOTE *	BSA10148-3	SED 5 ON MAP-NORTHERN PORTION OF SITE IN DRAINAGE DITCH BETWEEN RFE AND CONUS CHEM. CO.	HSL + 30	$1725.00
BSA10148486	SEE NOTE *	BSA10148-1	MW 1	VOA + METALS	$700.00
BSA10148487	SEE NOTE *	BSA10148-1	MW 2	VOA + METALS	$700.00
BSA10148488	SEE NOTE *	BSA10148-1	SW 1 ON MAP-SAME AS SED 1 LOCATION.	HSL + 30	$1600.00
BSA10148488 MS	SEE NOTE *	BSA10148-1	SAME AS SW 1	HSL + 30	NO CHARGE
BSA10148488 MSD	SEE NOTE *	BSA10148-1	SAME AS SW 1	HSL + 30	NO CHARGE
BSA10148489	SEE NOTE *	BSA10148-2	SW 2 ON MAP-COMMON ALLEYWAY BETWEEN AUTOMATIC ELECTRO-PLATING, CWC AND FLEET AUTOELECTRIC.	HSL + 30	$1600.00
BSA10148490	SEE NOTE *	BSA10148-1	SW 3 ON MAP-SAME AS SED 4 LOCATION.	HSL + 30	$1600.00
BSA10148491	SEE NOTE *	BSA10148-2	SW 4 ON MAP-DRAINAGE WAY BETWEEN AUTOMATIC ELECTROPLATING & CWC.	HSL + 30	$1600.00

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WESTON SAMPLES

SAMPLE #	SHUTTLE SEAL # UPON ARRIVAL AT BPA OFFICE	SHUTTLE RESEAL # FOR SHIPMENT BACK TO WESTON LABS	LOCATION	ANALYSIS	COST EACH
BSA10148492	SEE NOTE *	BSA10148-4	SOIL DIOX 1 ON MAP-NEAR DUMPSTER AT SUN CHEMICAL.	2,3,7,8 TCDD	$ 450.00
BSA10148493	SEE NOTE *	BSA10148-4	SOIL DIOX 2 ON MAP-FROM COBBLES BETWEEN AUTOMATIC ELECTRO-PLATING AND FORMER ARKANSAS CHEMICAL CO. BUILDINGS.	2,3,7,8 TCDD	$ 450.00
BSA10148494	SEE NOTE *	BSA10148-4	SOIL DIOX 3 ON MAP-APPROXIMATE CENTER OF AVON DRUM SITE.	2,3,7,8 TCDD	$ 450.00
BSA10148495	SEE NOTE *	BSA10148-4	SOIL DIOX 4 ON MAP-BEHIND FORMER ARKANSAS CHEMICAL CO. WAREHOUSE.	2,3,7,8 TCDD	$ 450.00
SA10148496		BSA10148-4	DIOXIN 5-PROFICIENCY SAMPLE - # UNLV-QASL TCDD STD H23BL37Q1.	2,3,7,8 TCDD	$ 450.00
BSA10148497	SEE NOTE *	BSA10148-1	FIELD BLANK-TROWEL	HSL + 30	$1600.00
BSA10148498	SEE NOTE *	BSA10148-1	TRIP BLANK	VOA	$ 400.00
				TOTAL	$47350.00

(3)

* Upon arrival to the BPA office, it was noted that the sample bottles were divided among four shuttles, however the bottles were not organized within each shuttle according to complete HSL sample sets (i.e. Soil Samples consisted of two 40 ml VOA bottles and one 500 ml jar for remaining fractions; water samples consisted of two 40 ml VOA, one 1L plastic CN-container, one 1L plastic metals container, and three 1L amber glass containers for the AE/BN and pesticides/PCBs fractions).

After sample collection, the bottles were rearranged for shipment back to Weston so that entire sample sets would remain together.

The contents of shuttles upon arrival to the BPA office and for shipment back to the lab are as follows:

Shuttle contents upon arrival to BPA

SHUTTLE SEAL # (Weston Seal)	CONTENT
1	20 X 1L amber bottles
2	27 X 500 ml jars 20 X 1L plastic with preservatives (NAOH for CN containers and HNO_3 for metals containers).
3	20 X 40 ml bottles with HCl. 48 X 40 ml bottles without preservatives. 9 X 1L amber 4 X 40 ml VOA with lab water.
4	6 X 1L amber bottles with lab water. 4 X 12 plastic containers with lab water. 2 X 40 ml VOA with lab water.

Shuttle Contents for Shipment back to Weston

SHUTTLE SEAL # (BPA Seal)	CONTENTS
BSA10148-1	16 X 40 ml VOA 15 X 1L amber 7 X 1L plastic-metals 5 X 1L plastic-cyanide These contents comprised sample #'s: BSA10148486 BSA10148487 BSA10148488 BSA10148488MS

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	BSA10148488MSD BSA10148490 BSA10148498 BSA10148499
BSA10148-2	6 X 40 ml VOA 2 X 1L plastic-metals 2 X 1L plastic-cyanides 6 X 1L amber Contents comprised sample #'s: BSA10148489 & BSA10148491
BSA10148-3	22 X 500 ml jars 44 X 40 ml VOA Contents comprised sample #'s: BSA10148466 through BSA10148485 including BSA10148467MS and BSA10148467MSD
BSA10148-4	5 X 500 ml jars Contents comprised sample #'s: BSA10148492 through BSA10148496

SUMMARY OF SAMPLING DATA
METALS (CONT.)

DATE SAMPLED 11-14-88 ppb ppm →
SAMPLE NO.
MATRIX
UNITS

	MW-1	MW-2	SW-3	SW-4	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-11	S-12	S-13	S-14	Sed-3	Sed-4	Sed-5
Selenium																			
Silver			112	55.1					25.4										
Sodium																			
Thallium																			
Vanadium						108			388	205				144					
Zinc	51,500	84,600		35,500	635	554	484	538	1790	1106	1010	719	1320	1680	1120	1170	630	5230	977
Cyanide			5580						131									69	

Other

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SUMMARY OF SAMPLING DATA
METALS

DATE SAMPLED 11-14-88
SAMPLE NO.
MATRIX
UNITS ppm

	S-13	S-14	Sed-2	Sed-3	Sed-4	Sed-5
Aluminum						
Antimony	145	27.1				
Arsenic	20.3	78.1				
Barium	560	554				468
Beryllium						
Cadmium	5.2	5.1		4	14.1	12
Calcium						
Chromium	5360	797	369		209	512
Cobalt						
Copper	234	342			895	323
Iron						
Lead	1320	2360		234	482	697
Magnesium						
Manganese						
Mercury	1.8	5.9	12			3.9
Nickel			347		668	127
Potassium						

HUMMEL CHEMICAL COMPANY
185 FOUNDRY STREET
NEWARK, ESSEX COUNTY
EPA ID# NJD002174712

The Hummel Chemical Company formerly operated a chemical warehouse/distribution center out of a small industrial complex at 185 Foundry Street in Newark, Essex County. It is also likely that operations at the site included reacting and mixing of chemicals, most of which were in powdered form. Hummel Chemical was located in Newark until the mid 1960's when operations were transferred to South Plainfield, New Jersey. It is not known how long the company operated at the Newark site. It is also not known what buildings within the complex the company may have occupied. Officials of Hummel Chemical and the Norpak Corporation/KEM Realty Company, who formerly owned a majority of the property in the complex, were questioned as to what buildings Hummel Chemical may have occupied, but no records with that information are available.

Very little information is available concerning the company's operations in Newark. According to EPA's publication, "Dioxins", published in 1980, potential dioxin precursors such as 2,4-dinitrophenoxyethanol, 3,5-dintrosalicylic acid, picric acid and hexachlorobenzene were present at Hummel Chemical Newark plant. However, it is unknown what other types of chemicals may have been present at the site or what types of storage/disposal methods were used by the company.

A review of information concerning the company's South Plainfield facility had revealed that poor housekeeping and operational practices had led to fires, explosions and employee injury, as well as groundwater, surface water and soil contamination. Because of the company's disregard for employee and public health and safety, as well as the lack of concern for the environment as shown at their South Plainfield facility, it is probable that a similar sentiment existed at the company when they operated in Newark. Therefore, it is likely that improper disposal of hazardous substances also occurred at the Newark facility. Because dioxin type compounds like those which were present at Hummel Chemical's Newark facility do not readily migrate vertically through the soil column, it is likely that many of these substances may still be present near the soil surface. This is cause for concern as the site, as well as adjacent properties, many of which are vacant and may have also been used for disposal, are easily accessible to the public. It should also be noted that since many of the substances used by Hummel Chemical were in powdered form, and dioxin type compounds have an affinity to bind with soil particles, it is possible for contaminants to be transported offsite as dust particiles or aerosols. This would allow contaminants to spread throughout the area and possibly contaminate residential areas. The nearest residential area lies only .5 miles west of the site. Since storm drains in the area discharge to the Passaic River, it is also possible for the river to be contaminated by runoff from the site. This may have a direct impact on aquatic biota in

ATTACHMENT B

the river because dioxin type compounds may bioaccumulate in aquatic organisms and pose a biomagnification threat, which leads to the possibility of food chain contamination. Because the dioxin type compounds do not readily migrate vertically through the soil, this also makes them readily available to terrestrial organisms. Migratory birds would seem to be the most susceptible because of the proximity of the site to the Hackensack Meadowlands. It is also possible that other hazardous substances utilized by Hummel Chemical, besides the dioxin type compounds, may have also been improperly disposed and contributed to soil and surface water contamination. Depending upon the characteristics of these substances and their ability to migrate through the soil column, it is possible groundwater contamination has occurred. Groundwater in the area, which is used only for industrial purposes, is derived from two aquifer systems. The high yield aquifer originating from the Brunswick Formation, which is the main source of groundwater in Essex County, may be contaminated by substances disposed at the site although it is relatively deep and is protected in much of the area by confining clay layers. However, the low yield aquifer existing in the unstratified drift of Pleistocene age is more likely to be affected since it exists near the surface (Attachment F).

Another cause for concern is the health of employees of the current occupant of the buildings formerly utilized by Hummel Chemical. Because of mixing operations used by the company at their South Plainfield facility which allowed chemicals to spread throughout the process buildings, it is highly likely this also occurred at Newark. If these buildings were not properly decontaminated after Hummel Chemical's departure, employees may be constantly inhaling dangerous compounds.

Although the compounds known to be present at the site are considered Class III dioxin compounds (compounds which have a very low potential to change into dioxins), a high priority for further investigation is warranted because of the lack of information available and the threats to the population and the environment. It is recommended that a site inspection be conducted as soon as possible to characterize contamination present on site. Sampling should include shallow soil samples to be anlayzed for dioxins and priority pollutants plus forty, as well as deep soil samples to be anlyzed for priority pollutants plus forty. Determination of sampling locations and number of samples would be based on information obtained during an on-site presampling assessment. It is also recommended that officials of Hummel Chemical physically identify the buildings which they believe the company may have occupied. Wipe samples to be analyzed for dioxins should be taken from inside these buildings to determine if residues from past operations still exist which may constitute a health hazard to current employees. Based on review of sample analyses, additional investigations, including installation of monitor wells to survey groundwater conditions may also be necessary. All potential migration pathways of substances off site, including storm drains, should also be investigated and closed off. Lastly, it should also be ensured that proper security is implemented to prevent unauthorized entry onto the site.

ATTACHMENT B

Preliminary Assessment

Hummel Chemical Company
185 Foundry St.
Newark, Essex Co.
NJD002174712

ATTACHMENT B

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

EPA

I. IDENTIFICATION
01 STATE: NJ | 02 SITE NUMBER: D002174712

II. SITE NAME AND LOCATION

01 SITE NAME: Hummel Chemical Co.	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: 185 Foundry St.				
03 CITY: Newark	04 STATE: NJ	05 ZIP CODE:	06 COUNTY: Essex	07 COUNTY CODE:	08 CONG DIST:
09 COORDINATES LATITUDE: 40° 43' 34"	LONGITUDE: 74° 08' 01"	Block Unknown	Lot Unknown		

10 DIRECTIONS TO SITE: New Jersey Turnpike to Exit 15E. Take Doremus Ave. and make a right onto Roanoke Ave. Follow Roanoke to Foundry St. Make a right on Foundry St. and site is approximately 1500 feet to the left.

III. RESPONSIBLE PARTIES

01 OWNER: It is unknown what buildings that Hummel occupied, however the owner of the property	02 STREET:		
03 CITY: at that time was the Norpak/KEM Realty Company.	04 STATE:	05 ZIP CODE:	06 TELEPHONE NUMBER: ( )
07 OPERATOR: Hummel Chemical Company	08 STREET: 10 Harmich Road		
09 CITY: South Plainfield	10 STATE: NJ	11 ZIP CODE: 07090	12 TELEPHONE NUMBER: 201 754-1800

13 TYPE OF OWNERSHIP: ☒ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ______ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE: ☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION: ☐ YES DATE __/__/__ (MONTH DAY YEAR) ☒ NO

BY: ☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): ______

02 SITE STATUS: ☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: ______ BEGINNING YEAR ______ ENDING YEAR ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED:
Picric acid, hexachlorobenzene, 3,5 dimtro salicylic acid and 2,4-dintrophenoxyethanol, which are all potential dioxin precursors, were known to be present at the site. It is unknown what other substances may have been present. See hazardous substance listing for substances which were possibly present.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION:
Although little is known about Hummel's operations in Newark, the disregard for the environment and public and employee health and safety at the company's South Plainfield facility leads to the likelihood that soil, groundwater and surface water contamination has also occurred at Newark.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☒ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Robert Beretsky	02 OF (Agency/Organization): NJDEP/DHWM/BPA		03 TELEPHONE NUMBER: (609) 984-3014
04 PERSON RESPONSIBLE FOR ASSESSMENT: Robert Beretsky	05 AGENCY: NJDEP	06 ORGANIZATION: DHWM/BPA	07 TELEPHONE NUMBER: (609) 984-3014
			08 DATE: 9/11/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

ATTACHMENT B

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D002174712

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)	02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)	03 WASTE CHARACTERISTICS (Check all that apply)
☐ A. SOLID ☐ E. SLURRY ☐ B. POWDER, FINES ☐ F. LIQUID ☐ C. SLUDGE ☐ G. GAS ☐ D. OTHER ______ (Specify)	TONS ______ CUBIC YARDS Unknown NO. OF DRUMS ______	☒ A. TOXIC ☐ E. SOLUBLE ☐ I. HIGHLY VOLATILE ☐ B. CORROSIVE ☐ F. INFECTIOUS ☐ J. EXPLOSIVE ☐ C. RADIOACTIVE ☒ G. FLAMMABLE ☐ K. REACTIVE ☒ D. PERSISTENT ☒ H. IGNITABLE ☐ L. INCOMPATIBLE ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			According to EPA's "DIOXINS"
OLW	OILY WASTE			book published in 1980, 2,4
SOL	SOLVENTS			dinitrophenoxy ethanol, hexachlor-
PSD	PESTICIDES			obenzene, 3,5 dinitrosalicylic acid
OCC	OTHER ORGANIC CHEMICALS	Unknown		and picric acid were present at
IOC	INORGANIC CHEMICALS			the Newark site. However it is
ACD	ACIDS			unknown how much of these
BAS	BASES			substances were present. It is
MES	HEAVY METALS			also unknown what other types of substances may have been present.

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	2,4-Dintrophenoxyethonol		Present on site accroding to		
OCC	3,5-dinitrosalicylic acid		EPA's "DIOXINS" book - see		
OCC	hexachlorobenzene	118-74-1	Attachment A		
OCC	picric acid				
OCC	2,4-dinitrophenol	51-28-5	These substances are used by Hummel		
OCC	hydrazine	302-01-2	Chemical at their South Plainfield, NJ		
	[illegible]	[illegible]	plant. These substances were also		
OCC	hexachloroethane	67-72-1	possibly present at the Newark facility		
IOC	lead nitrate	18256-98-4	since it is believed similar operations		
IOC	lead dioxide	7439-92-1	were conducted at both facilities.		
IOC	lead chromate	18454-12-1			
IOC	bariumchromate	7440-47-3			
IOC	zinc oxide	7440-66-6			
OCC	ethylene glycol	107-21-1			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Attachment A - EPA - "DIOXINS" EPA-600/2-80-197

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D002174712

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)
- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER ______ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)
- TONS ______
- CUBIC YARDS ______
- NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)
- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
ME	Arsenic	7440-38-2			
OCC	Isopropanol	67-63-0			
SOL	Methanol	67-56-1	These substances are used by Hummel		
A	Nitric acid	7697-37-2	Chemical at their South Plainfield plant.		
ACD	Oxalic acid	144-62-7	These substances were also possibly		
AC	Rosin acid	999	present at the Newark facility since it		
BA	Sodium hydroxide	1310-73-2	is believed similar operations were con-		
OCC	Toluene	108-88-3	ducted at both sites.		
OCC	Resorcinol	108-46-3			
IO	Cupric oxide	7440-50-8			
IOC	Antimony trisulfide	7740-58-2			
OCC	Ammonium oxalate	999			
IO	Lead thiocyanate	592-87-0			
SOL	Acetone	67-64-1			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-12 (7-81)

58

ATTACHMENT B

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D002174712

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION 02 [ ] OBSERVED (DATE ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Although dioxin type compounds do not readily migrate through soil, other substances which were improperly disposed by the company may migrate through soil and contaminate groundwater.
Attachment D,E,F

01 [X] B. SURFACE WATER CONTAMINATION 02 [ ] OBSERVED (DATE ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Improperly disposed hazardous substances may enter the nearby Passaic River via storm drains or groundwater discharges. Storm drains in the area discharge to the river.
Attachment

01 [ ] C. CONTAMINATION OF AIR 02 [ ] OBSERVED (DATE ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION Attachment C

Hazardous substances disposed by the company may become airborne as dust particles or aerosols. The company is also known to have mixed powdered chemicals in a manner which allowed the chemicals to become airborne throughout the process buildings. These chemicals could have also been transferred to the outside atmosphere via exhaust fans. (Att.

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS 02 [ ] OBSERVED (DATE ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ 04 NARRATIVE DESCRIPTION

The company has not been located at the Newark facility for more than twenty years, therefore a potential for fires or explosions as a result of Hummels' activities is very low.

01 [X] E. DIRECT CONTACT 02 [ ] OBSERVED (DATE ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ 04 NARRATIVE DESCRIPTION

It is unknown what type of disposal/storage methods were used by the company at the Newark facility. However, poor housekeeping and operational practices, which are a trademark of Hummel, may have lead to improper disposal on adjacent properties which are easily accessible to private citizens. Attachment C,E

01 [X] F. CONTAMINATION OF SOIL 02 [ ] OBSERVED (DATE: ______) [X] POTENTIAL [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Soil contamination may have occurred as a result of poor housekeeping and operational practices which are common at Hummel Chemical facilities. Also, since dioxin type compounds, similar to those produced by the company, do not readily biodegrade or migrate through soil, it is likely any of these substances disposed by the company are still present. Attachment A,C,E

01 [ ] G. DRINKING WATER CONTAMINATION 02 [ ] OBSERVED (DATE ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

There are no drinking water sources in the area, therefore no potential exists.

01 [X] H. WORKER EXPOSURE/INJURY 02 [ ] OBSERVED (DATE ______) [X] POTENTIAL [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Because Hummel was known to have mixed powdered chemdicals in a manner which allowed the chemicals to spread throughout their process building, it is likely employees of the current occupant may come into contact with these chemicals if the building was not completely decontaminated. Attachment C

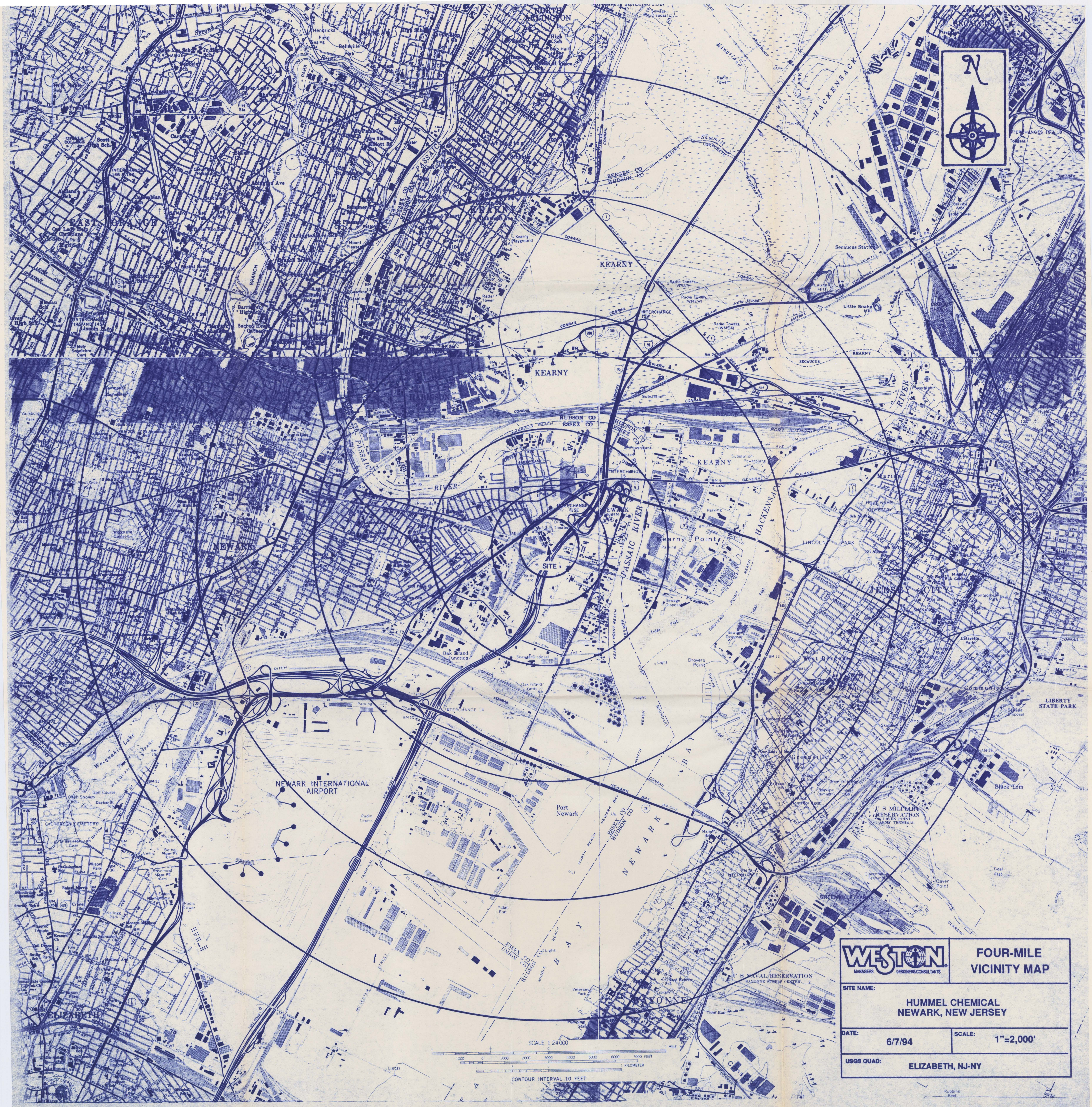
01 [X] I. POPULATION EXPOSURE/INJURY 02 [ ] OBSERVED (DATE ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Private citizens could be exposed to hazardous substances which were improperly disposed by the company. Citizens could come into contact with the substances as dust particles or aerosols which were blown off site. A large residential area lies only .5 miles west of the site.
Attachment A, C

EPA FORM 2070-12 (7-81)

ATTACHMENT B

REFERENCE NO. 3


N
NORTH ARLINGTON
EAST ORANGE
KEARNY
Secaucus Station
Little Snake Hill
HACKENSACK RIVER
HUDSON CO
ESSEX CO
PASSAIC RIVER
Kearny Point
SITE
NEWARK
JERSEY CITY
LIBERTY STATE PARK
NEWARK INTERNATIONAL AIRPORT
Port Newark
NEWARK BAY
U.S. MILITARY RESERVATION
U.S. NAVAL RESERVATION
BAYONNE
ELIZABETH
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
WESTON
MANAGERS DESIGNERS/CONSULTANTS
FOUR-MILE VICINITY MAP
SITE NAME:
HUMMEL CHEMICAL
NEWARK, NEW JERSEY
DATE:
6/7/94
SCALE:
1"=2,000'
USGS QUAD:
ELIZABETH, NJ-NY

REFERENCE NO. 4

THE LATEST TRIASSIC AND EARLY JURASSIC FORMATIONS OF THE NEWARK BASIN (EASTERN NORTH AMERICA, NEWARK SUPERGROUP): STRATIGRAPHY, STRUCTURE, AND CORRELATION

PAUL E. OLSEN

Bingham Laboratories, Department of Biology
Yale University
New Haven, Connecticut 06520

ABSTRACT. *Newark Supergroup deposits of the Newark Basin (New York, New Jersey, and Pennsylvania) are here divided into nine formations called (from the bottom up): Stockton Formation (maximum 1800 m); Lockatong Formation (maximum 1150 m); Passaic Formation (maximum 6000 m); Orange Mountain Basalt (maximum 200 m); Feltville Formation (maximum 600 m); Preakness Basalt (maximum +300 m); Towaco Formation (maximum 340 m); Hook Mountain Basalt (maximum 110 m); and Boonton Formation (maximum +500 m). The latter seven formations are new and result from subdividing the Brunswick Formation and Watchung Basalt of Kümmel and Darton. Each formation is characterized by its own suite of lithologies, the differences being especially obvious in the number, thickness, and nature of their gray and black sedimentary cycles (or lack thereof).*

Newark Basin structure still escapes comprehensive understanding, although it is clear that faults (predominantly normal) and onlaps bound both the eastern and western edges of the basin. The cumulative thickness of formations and the apparent movement of the faults is greater on the western than the eastern side, however.

Fossils are abundant in the sedimentary formations of the Newark Basin and provide a means of correlating the sequence with other early Mesozoic areas. The Stockton, Lockatong, and most of the Passaic Formation are Late Triassic (?Middle and Late Carnian — Rhaetic) while the uppermost Passaic Formation (at least locally) and younger beds appear to be Early Jurassic (Hettangian and Sinemurian) in age. The distribution of kinds of fossils is intimately related to sequences of lithologies in sedimentary cycles.

Manuscript received 2 Jan 1980.
Manuscript accepted 14 Jan 1980
Revised manuscript received 16 Sep 1980.

INTRODUCTION

Despite well over a century of interest in the early Mesozoic Newark Supergroup of eastern North America, many fundamental aspects of its historical and structural geology remain unexplored. In part, this is due to the complexity of stratigraphic and structural relations in the individual basins, coupled with the rarity of continuous exposures. As a result, much of our accepted understanding of the Newark Supergroup has been based on incomplete observations and opinion. The purpose of this paper is to provide a more thorough observational foundation against which past hypotheses may be assessed and on which future work may be based. Emphasis is placed on the younger beds of the Newark Basin, for they have never been examined in detail, and a new stratigraphic framework is proposed. These younger Newark Basin beds provide us with a key to understanding the entire basin column, which in turn is crucial to the context in which early Mesozoic organic evolution, continental sedimentation, and tectonic development are to be studied.

REGIONAL SETTING

Triassic and Jurassic Newark Supergroup rocks (Figure 1) (Olsen, 1978; Van Houten, 1977) occupy numerous elongate basins in eastern North America and consist of predominantly detrital fill locally more than 10,000 m thick. In most

Guide. In this way, nominal status is given to beds critical to the overall pattern of Newark Basin historical geology.

DESCRIPTIVE STRATIGRAPHY OF THE POST-LOCKATONG FORMATIONS

The Passaic Formation

The name Passaic Formation is proposed for the predominantly red siltstone, sandstone, and conglomerate which conformably overlie the Lockatong Formation and which underlie the Orange Mountain and Jacksonwald basalts. It is equivalent to the pre-basalt part of Kümmel's Brunswick Formation (Table 1). The type section (Figure 4) consists of intermittent exposures

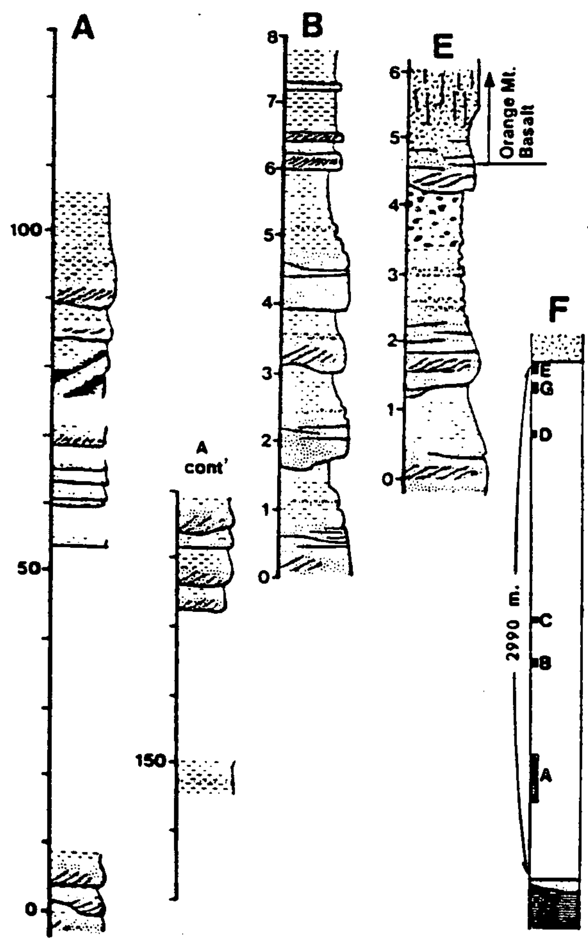


Fig. 4. A - E, type section of Passaic Formation (see Appendix for description); F, diagram showing positions of sections A - E in Passaic Formation.

of red siltstone and sandstone along interstate Route 80 near Passaic, New Jersey (Figure 2 and Appendix).

As is the case for all Newark formations, the estimation of stratigraphic thicknesses in the Passaic Formation is hampered by the presence of a series of faults with variable amounts of dip-slip displacement cutting much of the Newark Basin. The exact distribution of these faults is poorly known and thus many trigonometrically computed thicknesses in the Passaic Formation are probably overestimations. This is especially true in the northern and southern portions of the Newark Basin. The field relationship of mapped gray siltstones in the central Newark Basin, however, shows that in broad areas these smaller faults are missing and the calculated stratigraphic thickness is probably correct (McLaughlin, 1943). Instead of a large number of small faults, the central Newark Basin is cut by several very large faults (Figure 2).

In spite of these mensuration problems, it is clear that the Passaic Formation is the thickest, coherent lithologic unit in the Newark Basin, reaching a maximum calculated stratigraphic thickness of over 6,000 m (Jacksonwald Syncline). The formation outcrops throughout the Newark Basin although its upper beds are preserved only in the Watchung Syncline (Figure 2), in the smaller synclines preserved along the eastern side of the Flemington Fault, and in the Jacksonwald Syncline. In all other areas, the upper Passaic Formation has been removed by post-Newark erosion.

While in most areas the Passaic Formation rests conformably on Lockatong Formation, in several areas on the western margin of the Newark Basin, the Passaic directly onlaps the step-faulted basement without any intervening Stockton or Lockatong. In these areas (see Figure 5), the thickness of upper Passaic Formation present below the Orange Mountain Basalt is comparatively slight. One area where these relationships can be clearly seen is near Cushetunk Mountain (Figure 5) in central New Jersey. In the New Germantown Syncline, the stratigraphic distance from the Palaeozoic basement to the Orange Mountain Basalt is about 800 m. Less than 30 km to the southwest, over 1,000 m of Passaic is

REFERENCE NO. 5

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT

DIVISION OF WATER POLICY
AND SUPPLY

SPECIAL REPORT NO. 28

GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

Prepared in cooperation with
United States Department of the Interior
Geological Survey

1968

GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

By

WILLIAM D. NICHOLS

Hydrologist, U. S. Geological Survey

SPECIAL REPORT NO. 28

1 9 6 8

Prepared by the U. S. Geological Survey

in Cooperation with the

State of New Jersey

Population of Essex County 1900-60

1900	359,053
1910	512,886
1920	652,089
1930	833,513
1940	837,340
1950	905,949
1960	923,545

Nearly 90 percent of the county's population is located in the 71.5 square miles (55.6 percent of total area) east of the Watchung Mountains.

The economy of Essex County is primarily industrial. The principal manufactured products include food products, electrical goods and machinery, chemicals, machinery (excluding electrical machinery), fabricated metal products, and apparel. In 1960, only about 5 percent of the total land area of the county was utilized as farmland.

GEOLOGY

INTRODUCTION

The Brunswick Formation and Watchung Basalt of the Newark Group of Late Triassic age underlie all of Essex County. The Brunswick Formation is dominantly shale and sandstone, but also includes minor amounts of conglomerate. The Watchung Basalt consists of three extensive sequences of lava flows intercalated with the shale and sandstone of the Brunswick Formation. The generalized bedrock geologic map (fig. 2) shows the areal extent of the rocks of Triassic age underlying Essex County. Overlying the rocks of the Newark Group are unconsolidated clay, sand, and gravel deposited during the Pleistocene and Recent Epochs. Pleistocene deposits are the most widespread and are found throughout the county. Deposits of Recent age are confined to the present-day stream valleys. Figure 3 shows the general distribution of the unconsolidated Pleistocene deposits.

Parts of Fairfield and Millburn Townships and Newark are underlain by valleys cut (fig. 3) in bedrock by streams that drained the area before the last glaciation. The valley were subsequently filled in and buried by glacial debris and have little present-day surface expression.

DISTRIBUTION AND LITHOLOGY OF ROCK UNITS

Consolidated Rocks

Rocks of the Brunswick Formation, the uppermost unit of the Newark Group, underlie most of Essex County. The formation consists dominantly of interbedded brown, reddish-brown, and gray shale, sandy shale, sandstone, and some conglomerate. Three sheets of gray to black basalt are intercalated with sandstone and shale beds of the Brunswick Formation. The total thickness of the Brunswick Formation is not known, but probably exceeds 6,000 feet (Kümmel 1940, p. 102).

In the southern part of the county east of the Watchung Mountains, the Brunswick Formation is predominantly a soft red shale. These rocks become coarser grained toward the north. In the northern part of the county the rocks are mostly sandstone and some interbedded shale; conglomerate is found in the extreme northern part of the county. This change from soft, easily weathered, shale to more resistant sandstone is reflected in the change of topography from the rather flat low-lying plain with few hills in southern Newark to hills of low relief in the northern part of the county.

Between First and Second Watchung Mountains, the Brunswick Formation is dominantly sandstone. West of Second Watchung Mountain, the formation is covered with thick deposits of unconsolidated sediments of glacial origin and few outcrops can be found. As indicated from records of wells drilled in this area, the rocks are mainly shale and some interbedded sandstone.

Two prominent ridges, First and Second Watchung Mountains, extend from northeast to southwest across the county (fig. 2). These are the two lowest sequences of basalt flows of the Watchung Basalt. The third, uppermost, sequence of flows is represented by Ricker Hill in Livingston Township. These basalt sheets were formed by lava which was extruded at three different times during the accumulation of the sedimentary rocks of the formation. Each of these sheets is made up of several lava flows. Scoriaceous zones occur at the top of many of the individual flows. In some places, thin beds of shale occur between successive flows. The lower part of the Watchung Basalt, which comprises First Watchung Mountain, is from 600 to 650 feet thick; the Watchung Basalt in Second Watchung Mountain varies from 750 to 900 feet in thickness; the uppermost Watchung Basalt ranges from 225 to 350 feet in thickness (Darton and others, 1908, p. 10).

First and Second Watchung Mountains are parallel, and in places have double-crested ridges reflecting the presence of interbedded sedimentary rocks; the ridges generally rise between 300 and 400 feet above the adjacent country. The trend of the ridges reflect the general strike of the sedimentary rocks of the Brunswick Formation. The beds dip about 10 degrees toward the northwest.

Pleistocene and Recent Deposits

Unconsolidated sediments deposited by glaciers or by glacial meltwater during the Pleistocene Epoch cover most areas of Essex County. These deposits can be divided roughly into several types. Unstratified drift called till or ground moraine is a heterogeneous mixture of clay, silt, sand, gravel, cobbles, and boulders which was deposited by the ice. Unstratified drift that has accumulated in a ridgelike deposit along the margin of a glacier is called an end moraine. Stratified drift is deposited by glacial meltwater in streams (glaciofluvial deposits) and lakes (glaciolacustrine deposits). Glaciofluvial deposits are generally stratified sand, and sand and gravel, and glaciolacustrine deposits are usually bedded or laminated silt and clay. Figure 3 is a map showing the generalized distribution of the Pleistocene deposits in Essex County.

Streams and rivers draining the Essex County area before the last glaciation cut deep valleys into the Triassic rocks (fig. 3). These valleys were subsequently buried by glacial debris, and the thickness of the glacial deposits is largely controlled by the underlying bedrock topography. The altitude of the floor of the buried bedrock valley under the Newark area is as much as 280 feet below sea level (fig. 4), and the glacial drift is as much as 300 feet thick. In the southwestern corner of Essex County in Millburn Township, the altitude of the valley floor is 17 feet above sea level and the drift averages 150 feet in thickness. In the northwestern part of the county in Fairfield Township, the floor of the valley is as much as 35 feet below sea level and the drift has a maximum thickness of about 200 feet. In the areas between the valleys, where the bedrock surface is high, the drift ranges from 0 to 70 feet thick.

East of the Watchung Mountains and west of the buried valley under the Newark area, the glacial deposits consist dominantly of till. The valley under the Newark area, however, is filled largely with stratified drift and interbedded lenses of till. In the central and southern part of Newark the main valley (fig. 4) is filled with as much as 200 feet of lacustrine clay and sandy clay, which is overlain by 50 to 100 feet of other stratified or unstratified glacial drift. In the northern part of Newark, where the valley (fig. 4) parallels the Passaic River, the valley contains several deposits of sand and gravel interbedded with clay and till. The sand and gravel ranges from 1 to 19 feet in thickness and is encountered mostly at depths of less than 50 feet and depths of more than 220 feet below land surface.

The present-day valley between First and Second Watchung Mountains is underlain by approximately 100 feet of stratified drift in both Cedar Grove in the north and Millburn Township in the south. These deposits consist mostly of stratified sand and gravel. Their maximum thickness appears to occur under that part of the valley west of the Rahway and Peckman Rivers; east of the rivers, the bedrock surface is shallow (30 to 50 feet below the valley floor), and the unconsolidated deposits are thin. There are not enough data to define the thickness and character of the subsurface glacial deposits in the valley in Verona and most of West Orange.

West of Second Watchung Mountain, the stratigraphy of the glacial deposits is moderately complex, especially in the buried valleys. The drift in the main buried valley in Livingston and Millburn Townships (fig. 3) has a maximum thickness of about 170 feet and consists of interbedded sand, sand and gravel, clay and till. Thicknesses of sand and gravel outwash range from 20 to 80 feet. Farther north, in north-western Fairfield, the main buried valley (fig. 3) is filled with as much as 200 feet of drift consisting almost exclusively of 140 to 170 feet of laminated silt and clay underlain by 10 to 30 feet of till. Deposits of fine- to medium-grained sand ranging in thickness from 0 to 20 feet occur on the surface.

FIG. 4

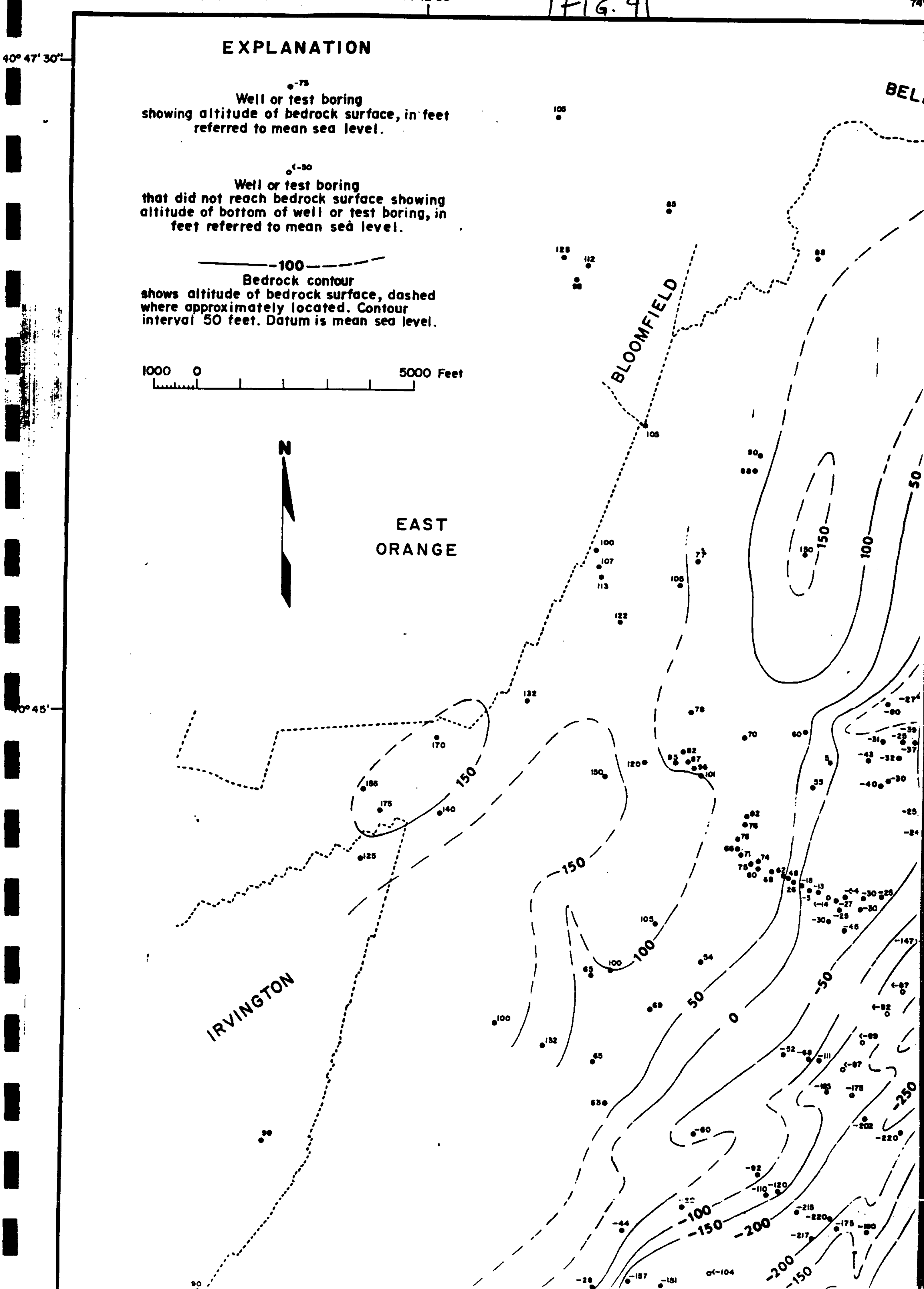

74°12'30"
74°
40° 47' 30"
40° 45'
EXPLANATION
Well or test boring
showing altitude of bedrock surface, in feet
referred to mean sea level.
Well or test boring
that did not reach bedrock surface showing
altitude of bottom of well or test boring, in
feet referred to mean sea level.
100
Bedrock contour
shows altitude of bedrock surface, dashed
where approximately located. Contour
interval 50 feet. Datum is mean sea level.
1000 0 5000 Feet
N
EAST
ORANGE
BLOOMFIELD
IRVINGTON
BELL

FIG. 4

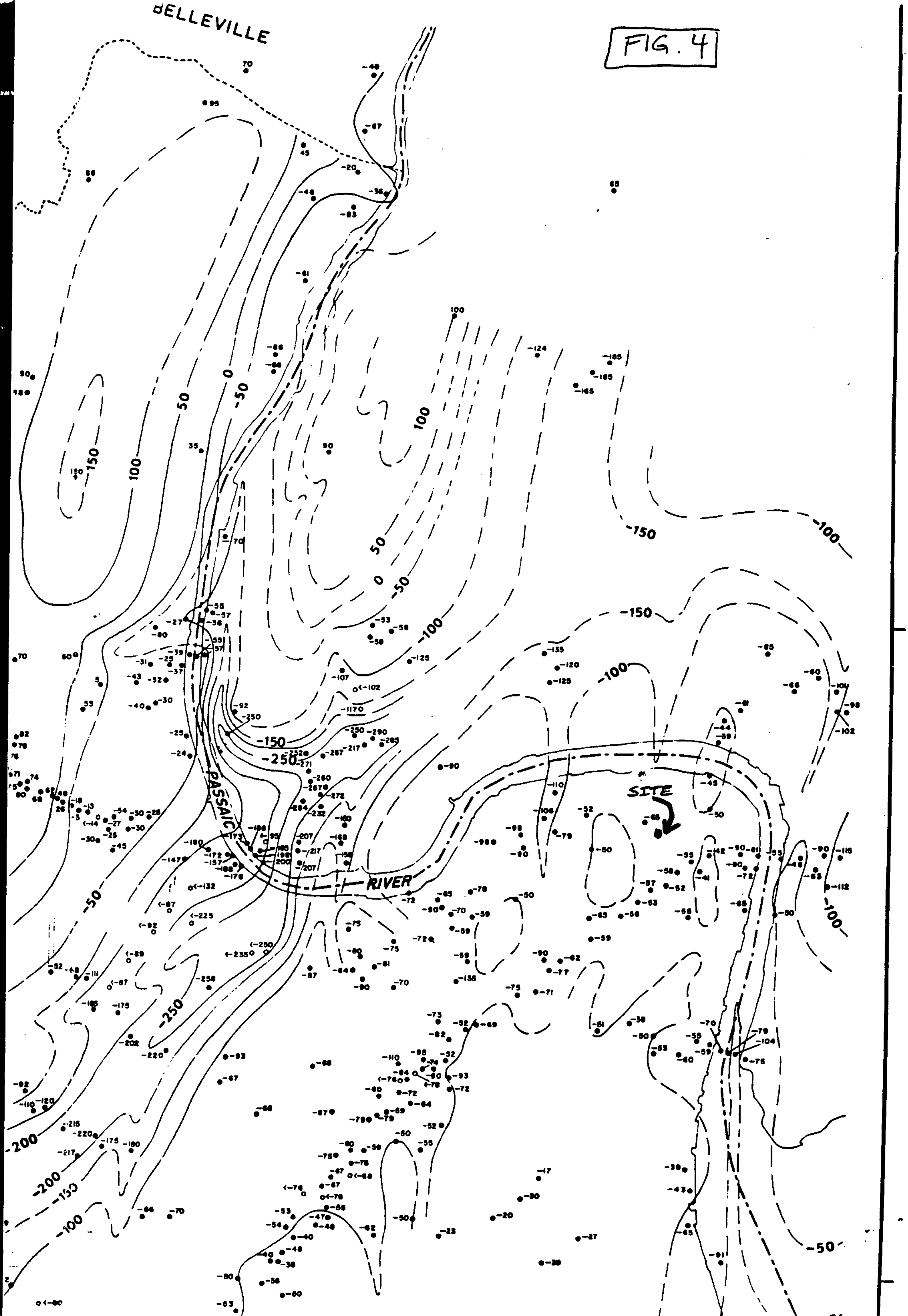
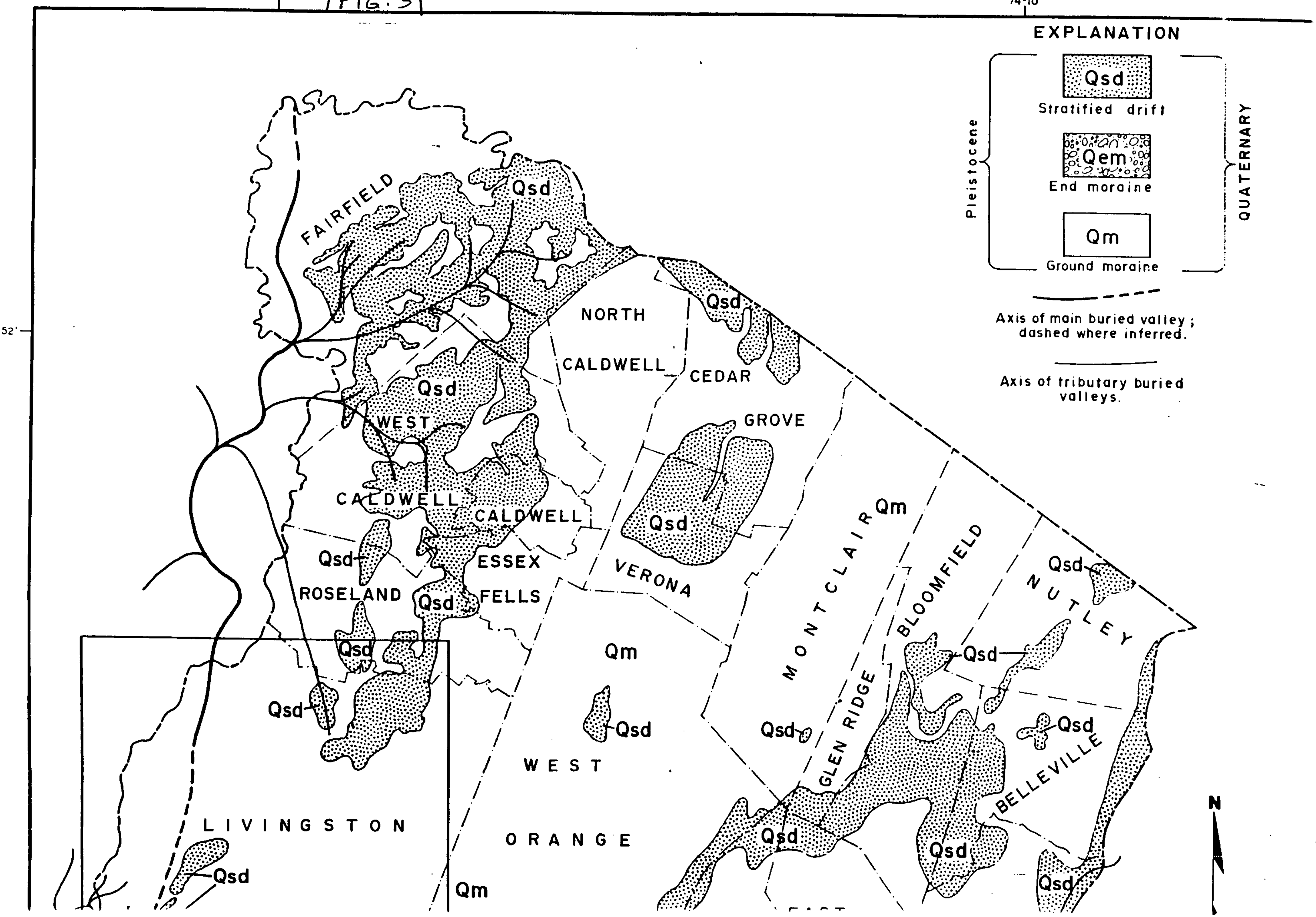


FIG. 3



74°20'
74°10
52'
EXPLANATION
Qsd
Stratified drift
Qem
End moraine
Qm
Ground moraine
Pleistocene
QUATERNARY
Axis of main buried valley; dashed where inferred.
Axis of tributary buried valleys.
N
FAIRFIELD
NORTH CALDWELL
CEDAR GROVE
WEST CALDWELL
CALDWELL
ESSEX FELLS
ROSELAND
VERONA
MONTCLAIR
GLEN RIDGE
BLOOMFIELD
NUTLEY
BELLEVILLE
WEST ORANGE
LIVINGSTON
Qsd
Qm

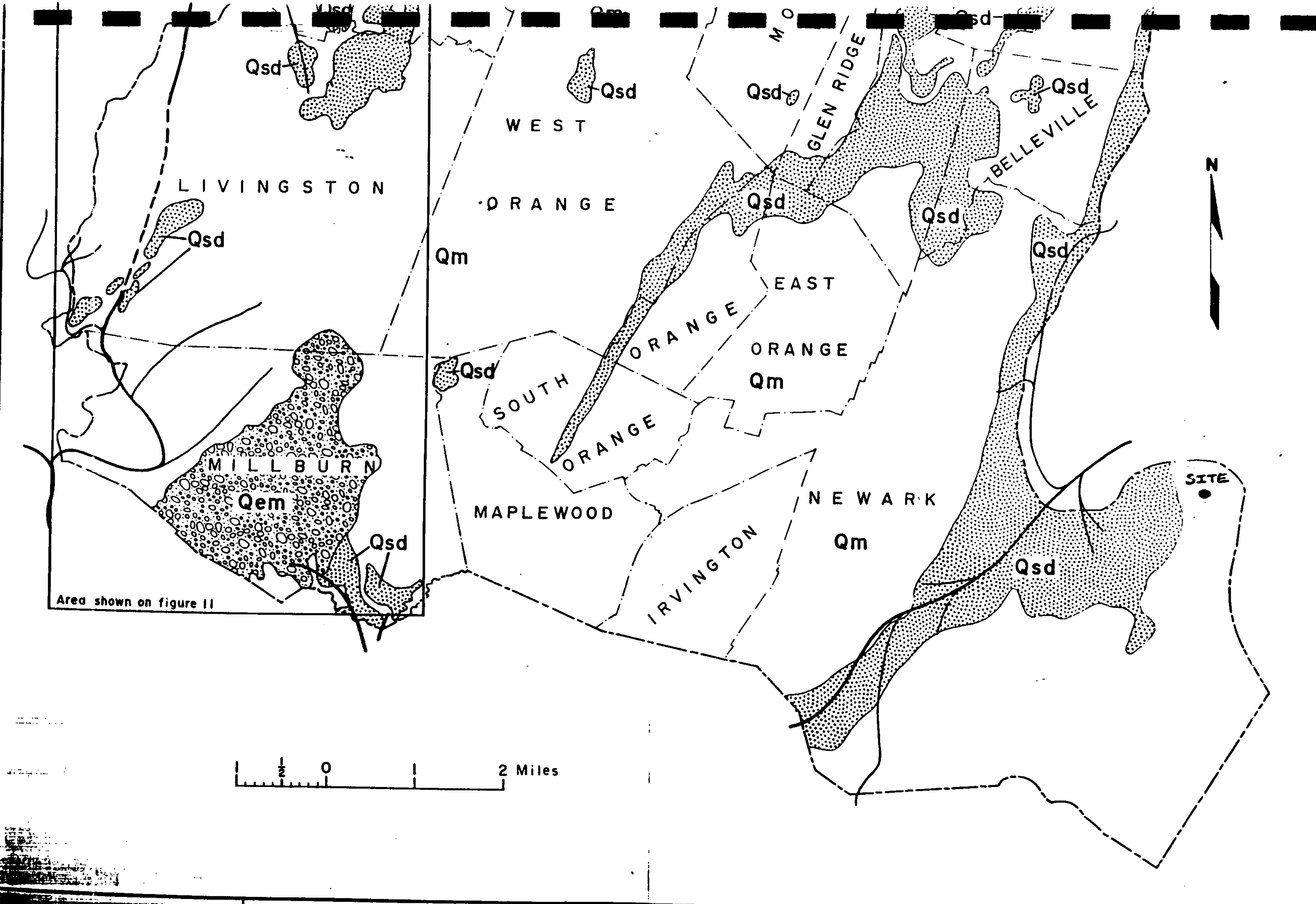


Figure 3.—Generalized surficial geologic map of Essex County, N. J. showing axes of buried valleys.

REFERENCE NO. 6

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s) [b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5}	35	25	15	15
Less than 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3–1.

3.1.2.5 *Calculation of potential to release factor value.* Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as the potential to release factor value for the aquifer. Enter this value in Table 3–1.

3.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3–1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3–8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (K_d).
- If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3-8.—GROUND WATER MOBILITY FACTOR VALUES [a]

Water solubility (mg/l)	Distribution coefficient (K_d) (ml/g)			
	Karst [c]	≤10	>10 to 1,000	>1,000
Present as liquid [b]	1	1	0.01	0.0001
Greater than 100	1	1	0.01	0.0001
Greater than 1 to 100	0.2	0.2	0.002	2×10^{-5}
Greater than 0.01 to 1	0.002	0.002	2×10^{-5}	2×10^{-7}
Less than or equal to 0.01	2×10^{-5}	2×10^{-5}	2×10^{-7}	2×10^{-9}

[a] Do not round to nearest integer.

[b] Use if the hazardous substance is present or deposited as a liquid.

[c] Use if the entire interval from the source to the aquifer being evaluated is karst.

REFERENCE NO. 7

WESTON

Keith Kobrowski
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Terry Romoana

Company NJDEPE

Address

Phone (609) 633-1179

Subject NJ wellhead Protection Program

Date 29 / Nov / 93

Time 1125 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO.

Notes:

As of this date NJDEPE has not established a wellhead protection program. The only regulation concerning well head protection is one which requires owners to control activities within 5 feet of the well head.

☐ File

☐ Tickle File / /

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials KR

RFW 110-4-83

REFERENCE NO. 8

WESTON

PROJECT NOTE

TO: Hummel Chemical File

DATE: 7-20-94

FROM: Dennis Foerter

W.O. NO.: 04200-016-081-00

SUBJECT: Groundwater use within 4 miles of Hummel Chemical Site.

Several Phone Conversations were conducted with officials of local municipalities within 4 miles of the Hummel Chemical, Newark Site. These calls were made to determine the groundwater use within these towns. Through these conversations, the following was determined:

- There are no wells used for drinking within 4 miles of the site.
- Wells within 4 miles of the site are used for industrial purposes.

Phone conversation records are attached and consist of the following towns within a 4-mile radius of the Hummel site:

- Newark
- Kearny
- Harrison
- East Orange
- Jersey City
- Elizabeth
- Bayonne
- North Arlington

All Phone Conversation records documenting the above findings are attached.

Dennis Foerter
7-20-94

rr/RUDKO/PROJECTF.ORM

WESTON

0211

A. Schweitzer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name: Anthony Debarros
Company: City of Newark - Water Supply
Address:

Phone: (201) - 256-4965
Subject: Water use in Newark

Date: 12 / 30 / 92
Time: 9:45 AM/PM

☒ Originator Placed Call
☐ Originator Received Call
W.O. NO. 4200-016-081-0008

Notes: Mr. Debarros informed me that Newarks water supply comes from two sources. The 2 sources are both surface water. The Wanaque which serves about 40% of the City including the Ironbound section of Newark. The Pequannock covers the rest of Newark including the Western half of the City. There are no domestic wells used in the city of Newark.

The Wanaque supply is located in Wanaque near the New York border. The Pequannock is located in West Milford Twp. The Wanaque is owned by the North Jersey District Water Supply Commission and the Pequannock is owned by the City of Newark.

In case of emergency, drinking water would be taken from another source (i.e. Jersey City, reservoirs etc.)

Theses supply serve other towns including Belleville and Bloomfield.

Andrew F. Schweitzer
12-30-92

☐ File
☐ Tickle File ___ / ___ / ___
☐ Follow-Up By:
☐ Copy/Route To:

Follow-Up-Action: Can call back if need be.

Originator's Initials AFS

WESTON

G. Schweitzer
Originator

041T

PHONE CONVERSATION RECORD

Conversation with:

Name Tony Scillia

Company East Orange Water Dept.

Address 99 S. Grove St.
East Orange 07019

Phone (201) 266-8869

Date 2/1/93

Time 1.50 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4200-016-081-0002

Subject Water Supply for East Orange

Notes: Livingston; Millburn; Florham Park
18 wells

All potable water for East Orange comes from 18 public supply wells located in Livingston, Millburn and Florham Park, New Jersey.

Andrew F. Schweitzer
2-1-93

☐ File

☐ Tickle File __/__/__

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials AFS

WESTON

G. Schweitzer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name ?

Company Jersey City Water Supply

Address

Phone 201-547-4390

Date 2/1/93

Time 9:00 AM/PM (AM circled)

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4200-016-081-0002

Subject Drinking Water Supply in Jersey City.

Notes:

There are no potable wells in Jersey City. However, there are deep industrial wells scattered throughout the city.

Andrew F. Schweitzer
2-1-93

☐ File

☐ Tickle File ___/___/___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials AFS

RF 110-4-83

WESTON

a. Schweitzer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name: Carol Donnelly
Company: Kearny Water Dept.
Address: 570 Elm St.
Kearny, NJ 07032
Phone: (201) 991-2700
Subject: Drinking Supply - Kearny

Date: 2 / 1 / 93
Time: 1:55 AM/PM
☐ Originator Placed Call
☐ Originator Received Call
W.O. NO. 4200-086-081-0002
Fax: (201) 991-0723

Notes: Wanaque - 15% owner.
North Jersey District Water Supply Commission
Some Industrial wells

There are no potable wells in Kearny. All drinking water comes from Wanaque reservoir of which Kearny is 15% partner. There are some industrial wells used for heating etc.

Andrew F. Schweitzer
2-1-93

☐ File
☐ Tickle File ___/___/___
☐ Follow-Up By:
☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials: AES

0287

A. Schwartz
Originator

WESTON

PHONE CONVERSATION RECORD

Conversation with:

Name Thomas Cistelli - Superintend

Time 2:15 AM/PM

Date 2 / 1 / 93

Company Harrison Water Dept

Address

☒ Originator Placed Call

☐ Originator Received Call

Phone (201) 268 - 2431

W.O. NO. 4200-016-081-0007

Subject Drinking Supply in Harrison

Notes: PVWC
Artesian Well - at school

They buy all of their water in bulk from the Passaic Valley Water Commission. There is one potable well located at the high school; it is an artesian well. It is not used for drinking water There are no industrial wells. (in use)

Andrew F. Schwartz
2-1-93

☐ File

☐ Tickle File ___ / ___ / ___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials AFS

RFW 110-4-83

WESTON

A. Schwartz
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Joan Moran

Company Elizabeth Water Dept.

Address

820-4265

Phone 908 - ~~[illegible]~~ 820-4120

Subject Drinking Water Supply in Elizabeth.

Date 2 / 1 / 93

Time ______ AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4200-016-081-0002

Notes: No Potable wells in Elizabeth. She is not sure if there is any industrial wells. She suggest that we contact the health department for that information.

Andrew F. Schwartz
2-1-93

☐ **File**

☐ **Tickle File** ____ / ____ / ____

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action: Will contact health department if needed.

Originator's Initials AFS.

WESTON

A. Schweitzer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name ?

Company Bayonne Water Engineering

Address

Phone (201) 858-6172

Subject Drinking water Supply in Bayonne

Date 2 / 1 / 93

Time 2:05 AM/PM (PM circled)

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4200-016-081-0007

Notes: All drinking water comes from Wanaque.
No public supply wells or private potable wells.

Andrew F. Schweitzer
2-1-93

☐ File

☐ Tickle File ___/___/___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials AFS

WESTON

T. Varner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Ethyl Senst

Company Passaic Valley Water Commission (PVWC)

Address

Phone (201) 340-4300

Subject Water supply sources

Date 05 / 06 / 93

Time 11:40 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 04200-016-081-0002

Notes: Ms. Senst told me that Harrison and North Arlington obtain their water via the PVWC from the Passaic River at Totowa and the Wanaque Reservoir. No wells are used.

☑ **File** Int'l Metallurgical Services

☐ **Tickle File** ____/____/____

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action:

Originator's Initials TAV

RFW 10-4-83

WESTON

A. Schweitzer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Bill Coupe

Company North Arlington Water Dept.

Address

Phone (201) 955-5665

Subject North Arlington Water Dept. Drinking Water

Date 2 / 2 / 93

Time 3:55 AM/PM (PM circled)

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4200-016-081-0003

Notes: Passaic Valley Water Commission

Drinking water comes from Passaic Valley Water commission. No wells are used for potable purposes.

☐ File

☐ Tickle File ___ / ___ / ___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action: May follow-up on industrial wells

Originator's Initials ARS

RFW 110-4-83

REFERENCE NO. 9

WETLAND LEGEND
APPROXIMATE 15-MILE TARGET DISTANCE LIMIT
UPPER BAY
WESTON
FIFTEEN-MILE SURFACE WATER PATHWAY MAP
HUMMEL CHEMICAL
NEWARK, NEW JERSEY
6/7/94
1"=2,000'
ELIZABETH, NJ-NY

REFERENCE NO. 10

WESTON

PROJECT NOTE

TO: Hummel Chemical File DATE: 7-20-94

FROM: Dennis Foerte W.O. NO.: 04200-016-081-0098

SUBJECT: Surface Water Migration Pathway for Hummel Chemical.

Several Phone Conversations with local and State officials have indicate the following

- Surface runoff within the Foundry St. Complex (where Hummel formerly operated) leads to common storm drains which lead to a combined sanitary/storm water system. However, in overflow conditions, stormwater is diverted to an overflow facility which discharges to the Passaic River.

- All coastal/tidal water bodies within the surface water migration pathway are fisheries. These water bodies consist of the Passaic River, Newark Bay, Arthur Kill, Kill Van Kull, ~~and~~ The Narrows.

All Phone conversation records documenting the above are attached.

- In addition a review of the Preliminary Assessment for SUN/DIC Acquisition Corp., aka Sun Chemical Corp. was completed to determine the flood plain. Sun Chemical is also located within the 185 Foundry Street address (same as former Hummel). A review indicates that the Foundry Street site is located in a 100-year flood plain. This report was completed by NUS Corp. for U.S. EPA in June 1989. (TDD No. 02-8904-) The report is not attached due to confidentiality.

- A review of the attached correspondence between WESTON and the NJDEPE water supply element indicates that there are no potable surface water intakes within 15 miles downstream of the PPE for Hummel Chemical.

Dennis Foerte

7-20-94

WESTON

T. Chiney
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Bob Soldwedel

Company Chief, Bureau of Freshwater Fisheries (NJDEPE)

Address

Phone (609) 292-8642

Date 05 / 24 / 93

Time 15:40 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 04200-016-081-0002

Subject Fishing in Newark Bay Complex

Notes: Mr. Soldwedel told me that, despite certain restrictions, people do fish in and keep fish from the Passaic River, Newark Bay, Arthur Kill, Kill Van Kull, and the Narrows area. He said that people fish anywhere there's a shoreline along these water bodies. He also said there was something on television showing people fishing in part of these waters.

☒ File Int'l Metallurgical Services

Follow-Up-Action:

☐ Tickle File ___/___/___

☐ Follow-Up By:

☐ Copy/Route To:

Originator's Initials TAV

WESTON

Dennis Foerter
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Andrea Hall

Company Newark Division of Water and Sewer

Address

Phone (201) 733-5972

Subject Storm drains - Foundry Street, Newark.

Date 7 / 20 / 94

Time ~~1400~~ 2:35 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 04200-016-081-0098

Notes:

Ms. Hall informed me that the Storm Drain in the Foundry Street Complex (where Hummel Chemical formerly operated) discharge to a combined Sanitary/storm water system. However, in times of overflow (wet weather conditions) storm water is discharged to the Passaic River in the area of Doremus Avenue (east of the site) by permit.

Dennis Foerter
7-20-94

☐ File

☐ Tickle File ____/____/____

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials

RFW 110-4-83

State of New Jersey
Department of Environmental Protection and Energy
Water Supply Element
CN 426
Trenton, NJ 08625-0426
Tel. # 609-292-7219
Fax. # 609-292-1654

Jeanne M. Fox
Acting Commissioner

Steven P. Nieswand, P.E.
Administrator

SEP 17 1993

SEPTEMBER 15, 1993

Weston
Raritan Plaza 1
4th Floor, Raritan Center
Edison, New Jersey 08837-3616

Att: Thomas A. Varner, Site Assessment Manager

Dear Mr. Varner:

Re: Surface Water Intakes

This is in regard to your letter of September 9, 1993 requesting information on surface water intakes within fifteen miles of two particular sites. You had further indicated that the intakes could be of a commercial, agricultural or potable nature. Please be advised that the Bureau of Safe Drinking Water (Bureau) regulates only Public Water Supplies as defined in the Safe Drinking Water Act. You may wish to contact the Bureau of Water Allocation at (609) 292-2957 for intakes other than those regulated by this Bureau.

commer agricultu

Rather than perform an analysis of the intakes, I have attached for your use copies of this Bureau's inventory of potable water intakes and an accompanying list with latitudes and longitudes of the intakes as per the information available to us.

If you should have any questions on the attached information, please call me at (609) 292-5550.

Very Truly Yours,

John F. Fields
Supervising Environmental Engineer
Compliance Section

attach

c Thomas McCarthy

SURFACE WATER INTAKES - PUBLIC SUPPLY

MUNICIPALITY	PURVEYOR	SOURCE	ID	LONG	LAT
[illegible]	US ARMY FT DIX	RANCOCAS CRK	0325001	74 37 47.10	39 57 36.08
[illegible]	ATLANTIC CITY WATER DEPT.	DOUGHTY RESERVOIR	0102001	74 31 21.06	39 25 48.75
[illegible]	HACKENSACK WATER CO.	ORADELL RESERVOIR	0238001	74 [illegible] 28.55	40 57 28.44
NEW MILFORD	HACKENSACK WATER CO.	HACKENSACK RIVER	0238001	74 1 36.64	40 56 47.63
CITY OF BURLINGTON	BURLINGTON CITY WATER DEPT.	DELAWARE RIVER (EXISTING)	0305001	74 50 21.82	40 5 19.78
CITY OF BURLINGTON	BURLINGTON CITY WATER DEPT.	DELAWARE RIVER (FUTURE)	0305001	74 50 36.07	40 5 14.45
CALDWELL TOWNSHIP	N. J. D. W. S. C.	POMPTON RIVER	1613001	74 16 22.79	40 53 58.59
CITY OF ORANGE	CITY OF ORANGE WATER DEPT.	[illegible] RIVER	[illegible]	[illegible]	40 45 33.65
MILLBURN TOWNSHIP	COMMONWEALTH WATER DEPT.	[illegible]	0712001	74 21 56.16	40 44 42.88
MILLBURN TOWNSHIP	COMMONWEALTH WATER DEPT.	CANOE BROOK	0712001	74 21 10.31	40 44 40.77
NEWARK	NEWARK	PEQUANNOCK WATER SHED	0714001	74 25 27.07	41 1 32.44
GREENWICH TOWNSHIP	DUPONT-REPAUNO PNT-GBBSTWN	DELAWARE RIVER		75 18 23.02	39 50 34.97
JERSEY CITY	JERSEY CITY DIV. OF WATER	BOONTON RESERVOIR	0906001	74 23 51.41	40 53 33.80
[illegible]	BOROUGH OF BLOOMSBURY	[illegible]	[illegible]	[illegible]	40 38 48.50
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	SWAN CREEK RES. EAST	1017001	74 55 28.18	40 21 40.52
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	SWAN CREEK RES. WEST	1017001	74 55 43.90	40 21 46.63
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	DELA.-RAR. CANAL (*)	1214001	74 56 46.94	40 21 55.90
TRENTON	CITY OF TRENTON	DELAWARE RIVER	1111001	74 46 45.57	40 13 19.06
CITY OF PERTH AMBOY	PERTH AMBOY WATER DEPT.	TENNENTS CK. (RECHARGE)	1216001	74 20 12.23	40 25 33.99
EDISON TOWNSHIP	MIDDLESEX WATER CO.	RARITAN RIVER	1225001	74 26 32.12	40 30 2.46
NEW BRUNSWICK	NEW BRUNSWICK WATER DEPT.	LAWRENCE BROOK	1214001	74 24 45.97	40 28 58.48
NO. BRUNSWICK TWP	TWP. OF NO. BRUNSWICK	DELA.-RAR. CANAL	1214001	74 34 59.03	40 27 38.49
SAYREVILLE	SAYREVILLE WATER DEPT.	SOUTH RIVER (RECHARGE)	1219001	74 21 41.75	40 24 58.99
WOODBRIDGE	MIDDLESEX WATER CO.	DELA.-RAR. CANAL	1225001	74 27 34.00	40 30 25.66
HOWELL TWP	N.J. WATER SUPP. AUTH.	MANASQUAN RIV. (PROPOSED)	1352005	74 11 27.43	40 10 31.82
HOWELL TWP	N.J. WATER SUPP. AUTH.	MANASQUAN RIV. (PROPOSED)	1352005	74 7 18.84	40 8 44.98
LONG BRANCH	MONMOUTH CONSOLID. WAT. CO.	SHARK RIVER	1345001	74 4 16.51	40 11 53.69
LONG BRANCH	MONMOUTH CONSOLID. WAT. CO.	JUMPING BROOK	1345001	74 3 57.82	40 12 11.83
MANALAPAN TWP.	MATCHAPONIX WAT. SUPP. CO.	MATCHAPONIX BROOK	1326004	74 21 50.42	40 18 33.20
SHREWSBURY	MONMOUTH CONSOLID. WAT. CO.	SWIMMING RIVER RES.	1345001	74 7 13.35	40 19 6.70
WALL TOWNSHIP	MONMOUTH CONSOLID. WAT. CO.	MANASQUAN RIV. GLENDOLA RES.	1345001	74 4 45.13	40 11 42.47
[redacted]					
JEFFERSON TWP.	JEFFERSON TWP. M. U. A.	LAKE SHAWNEE (*)	1414011	74 35 50.64	40 58 12.04
TOWN OF BOONTON	TOWN OF BOONTON	TAYLORTOWN RESERVOIR	1401001	74 23 0.06	40 57 13.06
TOWN OF MORRISTOWN	SOUTHEAST MORRIS COUNTY	CLYDE POTTS RESERVOIR	142001	74 34 51.90	40 48 21.61
[redacted]					
POMPTON LAKES	N. J. D. W. S. C.	RAMAPO RIVER	1613001	74 16 54.91	40 58 17.93
WANAQUE BOROUGH	N. J. D. W. S. C.	RAMAPO RIVER	1613001	74 16 44.68	40 59 33.45
WANAQUE BOROUGH	N. J. D. W. S. C.	WANAQUE RESER.	1613001	74 17 38.54	41 2 47.67
[redacted]					
FRANKLIN BOROUGH	FRANKLIN WATER COMMISSION	WALLKILL R. (FRANKLIN PND.)	1906002	74 35 20.05	41 6 41.79
FRANKLIN BOROUGH	FRANKLIN WATER COMMISSION	WALLKILL R. (FRANKLIN PND.)	1096002	74 34 17.07	41 8 14.40
NEWTON	NEWTON WATER DEPARTMENT	LAKE MORRIS	1915001	74 36 26.58	41 2 31.05
[redacted]					

SURFACE WATER INTAKES - PUBLIC SUPPLY

[illegible]	MUNICIPALITY	PURVEYOR	SOURCE	ID	LONG	LAT
UNI	CITY OF RAHWAH	RAHWAY WATER DEPARTMENT	RAHWAY RIVER	2013001	74 17 26.57	40 37 6.41
[illegible]	ELIZABETH	ELIZABETHTOWN WATER CO.	RARITAN RIVER	2004002	74 34 6.28	40 32 45.58
[illegible]	ELIZABETH	ELIZABETHTOWN WATER CO.	MILLSTONE RIVER	2004002	74 34 10.91	40 32 31.02
[illegible]	ELIZABETH	ELIZABETHTOWN WATER CO.	CONFL. OF RAR. & MILL. RVRS.	2004002	74 34 1.82	40 33 23.23
	HACKETTSTOWN	HACKETTSTOWN M. U. A.	LOWER MINE HILL RESERVOIR	2108001	74 47 41.62	40 51 23.77
	HACKETTSTOWN	HACKETTSTOWN M. U. A.	BURD RESERVOIR	2108001	74 48 1.64	40 50 27.91
	TOWN OF BELVIDERE	BUCKHORN SPRINGS WATER CO.	IMPOUND. RES. ON BUCKHORN CK	2103001	75 4 20.99	40 47 58.09
[illegible]	WASHINGTON	NEW JERSEY WATER CO.	ROARING ROCK CK RES.	2121001	75 1 48.22	40 45 55.70

SURFACE WATER INTAKE LOCATIONS
BUREAU OF SAFE DRINKING WATER

Prepared by: Michael Mariano

CENTRAL

TRENTON
BURL CITY
NEW BRUNS
N. BRUNS
NJWC

SAYREVILLE
BRICK
[illegible]
HOWELL
[illegible]
MATAW
[illegible]

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
0102001	ATLANTIC CITY WATER DEPARTMENT	609-345-3315	ABSECON	DOUGHTY POND - South tip - Mays Landing Rd. & Mill Rd.
0238001	HACKENSACK WATER DEPARTMENT	201-767-9300	PARAMUS	SADDLE RIVER - South of intersection of Paramus Rd. & Midland Ave.
			ORADELL	HACKENSACK RIVER - At Martin Ave.
			NORTHVALE	SPARK HILL CREEK - Northwest of intersection of Pegasus Ave. & Hill Terr.
			ORADELL	LONG SWAMP BROOK - At Martin Ave.
0305001	BURLINGTON CITY WATER DEPARTMENT	609-386-0307	EAST BURLINGTON	DELAWARE RIVER - 1/4 mile north of Assiscunk Creek
			BURLINGTON ISLAND	BURLINGTON ISLAND LAKE
0325001	FORT DIX	609-542-5040		RANCOCAS CREEK
1613001	NJDWSC	201-575-0225	POMPTON LAKES	RAMAPO RIVER - At Pompton Lake (pump to Wanaque Res.)
			WANAQUE	WANAQUE RESERVOIR - Ringwood Ave & Oricchio Ave
0717001	CITY OF ORANGE	201-762-6000	SOUTH ORANGE	ORANGE RESERVOIR - On West branch of Rahway River 40 ft upstream from dam

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
0712001	NJ AMERICAN NORTHERN DISTRICT	201-376-8800	MILLBURN	PASSAIC RIVER - At Kennedy Parkway
			SHORT HILLS	CANOE BROOK - North of Route 24
			CALDWELL	POMPTON RIVER - At Bridges Rd.
0714001	NEWARK WATER DEPT	201-256-4965		PEQUANNOCK WATER SHED
0906001	JERSEY CITY WATER DEPARTMENT	201-547-4390	BOONTON	BOONTON RESERVOIR - 200 yds northwest of Washington St Bridge
			ROCKAWAY	SPLIT ROCK RESERVOIR - Empties into Boonton Res. via Rockaway River
1017001	LAMBERTVILLE WATER DEPARTMENT	609-397-0526	LAMBERTVILLE	SWAN CREEK RESERVOIR EAST
			LAMBERTVILLE	SWAN CREEK RESERVOIR WEST
			LAMBERTVILLE	DELAWARE-RARITAN CANAL - At Swan St. (Emergency)
1111001	CITY OF TRENTON	609-989-3208	TRENTON	DELAWARE RIVER - At Rt 29 north of Calhoun St. Bridge
1216001	PERTH AMBOY	908-826-0290	OLD BRIDGE	TENNENTS POND - At Waterworks Rd.
1225001	MIDDLESEX WATER CO	908-634-1500	EDISON	DELAWARE-RARITAN CANAL & MILLSTONE RIVER - At Rt 18

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1214001	NEW BRUNSWICK WATER DEPARTMENT	908-745-5060	NEW BRUNSWICK	LAWRENCE BROOK - At Burnet St.
			NEW BRUNSWICK	DELAWARE-RARITAN CANAL - At George St & College Ave
1214001	NORTH BRUNSWICK	908-247-0922	FRANKLIN TWP	DELAWARE-RARITAN CANAL - At Suydan Ave.
1219001	SAYERVILLE	908-390-7000	OLD BRIDGE	SOUTH RIVER - At Main St North of Rt 18
1352005	NEW JERSEY WATER SUPPLY AUTH.		WALL TWP	MANASQUAN RIVER - Hospital Rd. North of Garden State Parkway (Pump to Manasquan Resevior)
1345001	NJ AMERICAN - MONMOUTH		WALL TWP	MANASQUAN RIVER - Hospital Rd. North of GSP (Pump to Glendola Reservoir)
			NEPTUNE TWP	SHARK RIVER - Off Corlies Ave. 2000' North of GSP
			NEPTUNE TWP	JUMPING BROOK - At Greensgrove & Corlies Aves
			LINCROFT	SWIMMING RIVER RESERVOIR - 1000' West of Swimming Riv.
1326004	MATCHAPONIX		MANALAPAN	MATCHAPONIX BROOK - At Wilson Ave.
1401001	TOWN OF BOONTON	201-299-7740	MONTVILLE	TAYLORTOWN RESERVOIR - At Taylortown Rd.

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1403001	BUTLER WATER DEPT	201-838-7200	BUTLER	KIKEOUT RESERVOIR - At Resevior Rd.
1424001	SOUTH EAST MORRIS COUNTY	201-538-5600	MENDHAM	CLYDE POTTS RESERVOIR - Cold Hill Rd & Woodland Rd
1506001	BRICK TWP	908-458-7000		METEDECONK RIVER
1603001	HALEDON WATER DEPT		HALEDON	HALEDON RESERVOIR - Lower Basin pump station at Belmont Ave.
1605002	PASSAIC VALLEY WATER COMMISSION	201-256-1566	WAYNE	POMPTON RIVER - At Confluence of Ramapo & Pequannock Rivers
			TOTOWA	PASSAIC RIVER - At Union Blvd.
1708300	E.I. DUPONT PENNSVILLE	609-299-5000		SALEM CANAL
1712001	SALEM WATER DEPT	609-935-0350	CLINTON TWP	LAUREL LAKE - At Waterworks Rd & Lake Ave.
			ALLOWAY TWP	ELKINTON MILL POND - Waterworks Rd. 3 miles east of Laurel Lake (Seasonal)
1903001	BRANCHVILLE WATER DEPARTMENT	201-948-6463	FRANKFORD TWP	BRANCHVILLE RESERVOIR - T300' norhteast of Mattison Ave & Mattison School Rd.
1906002	FRANKLIN WATER DEPT	201-827-7060	FRANKLIN BOROUGH	FRANKLIN POND - Franklin Ave. Across from plant
1915001	NEWTON WATER DEPT	201-383-3521	SPARTA TWP	MORRIS LAKE

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1921001	SUSSEX WATER DEPT	201-967-5622	WANTAGE TWP	COLESVILLE RESERVOIR - At. Brink Rd. 400' west of Rt. 23
2013001	RAHWAY WATER DEPT	201-388-0086	RAHWAY	RAHWAY RIVER - At pump station off Valley Rd & Lambert St.
2004002	ELIZABETHTOWN WATER COMPANY	201-345-4444	BRIDGEWATER TWP	RARITAN & MILLSTONE RIVERS - At confluence
2108001	HACKETTSTOWN MUA	201-852-3622	DRAKESTOWN	MINE HILL RESERVOIR - Off Mine Hill Rd.
			DRAKESTOWN	BURD RESERVOIR - Off Reservoir Rd. Southeast of

Surface Water Quality Standards

N.J.A.C. 7:9B

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

Office of Land and Water Planning
April 1994

STATE OF NEW JERSEY
Christine Todd Whitman, Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
Robert Shinn, Commissioner

ENVIRONMENTAL REGULATION
John Weingart, Assistant Commissioner

SURFACE WATER QUALITY STANDARDS

Authority
N.J.S.A. 13:1D-1 et seq., 58:10A-1 et seq.,and 58:11A-1 et seq.

Source and Effective Date
R.1993 d.610, effective December 6, 1993.
See:24 N.J.R.3983(a), 24 N.J.R. 4471(a), 25 N.J.R. 404(a), 25 N.J.R. 405(a), 25 N.J.R. 3755(a), 25 N.J.R. 5569(a), 26 N.J.R. 1124(a), 26 N.J.R. 1226(a)

Executive Order No. 66(1978) Expiration Date
Chapter 9B, Surface Water Quality Standards, expires on January 18, 1996

A copy of this document can be obtained by calling 609-633-1179
or by sending a written request to:

Steven P. Lubow
CN-423
Office of Land and Water Planning
Department of Environmental Protection and Energy
Trenton, NJ 08625

1. Maintenance, migration and propagation of the natural and established biota;

2. Primary and secondary contact recreation;

3. Industrial and agricultural water supply;

4. Public potable water supply after such treatment as required by law or regulation; and

5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Maintenance, migration and propagation of the natural and established biota;

3. Primary and secondary contact recreation; and

4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Migration of diadromous fish;

3. Maintenance of wildlife;

4. Secondary contact recreation; and

5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;

2. Maintenance and migration of fish populations;

3. Migration of diadromous fish;

4. Maintenance of wildlife; and

(e) The surface water classifications in Table 3 are for waters of the Passaic, Hackensack and New York Harbor Complex Basin:

TABLE 3

Waterbody	Classification
APSHAWA BROOK (Macopin) - Entire length	FW2-TP(C1)
ARTHUR KILL	
(Perth Amboy) - The Kill and its saline New Jersey tributaries between the Outerbridge Crossing and a line connecting Ferry Pt., Perth Amboy to Wards Pt., Staten Island, New York	SE2
(Elizabeth) - From an east-west line connecting Elizabethport with Bergen Pt., Bayonne to the Outerbridge Crossing	SE3
(Woodbridge) - All freshwater tributaries	FW2-NT
BEAR SWAMP BROOK (Mahwah) - Entire length	FW2-TP(C1)
BEAR SWAMP LAKE (Ringwood State Park)	FW2-NT(C1)
BEAVER BROOK	
(Meriden) - From Splitrock Reservoir Dam downstream to Meriden Road Bridge	FW2-TP(C1)
(Denville) - Meriden Road Bridge to Rockaway River	FW2-NT
TRIBUTARIES	
(Meriden) - Two tributaries located approximately three quarters of a mile southwest of Meriden	FW2-TP(C1)
BEECH BROOK	
(West Milford) - From State line downstream to Monksville Reservoir	FW2-TM
BELCHER CREEK (W. Milford) - Entire length	FW2-NT
BERRYS CREEK (Secaucus) - Entire length	FW2-NT/SE2
BLACK BROOK	
(Meyersville) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment and tributaries within the Great Swamp National Wildlife Refuge	FW2-NT(C1)
BLUE MINE BROOK	
(Wanaque) - Entire length, except segment described below	FW2-TM
(Norvin Green State Forest) - That portion of the stream and any tributaries within the Norvin Green State Forest	FW2-TM(C1)
BRUSHWOOD POND (Ringwood State Park)	FW2-TM(C1)

HAVEMEYER BROOK (Mahwah) - Entire length	FW2-TP(C1)
HEWITT BROOK (W. Milford) - Entire length	FW2-TP(C1)
HIBERNIA BROOK	
(Marcella) - Source to first Green Pond Road bridge downstream of Lake Emma	FW2-TP(C1)
(Hibernia) - First Green Pond Road bridge to confluence with Beaver Brook	FW2-TM
TRIBUTARY	
(Lake Ames) - Source to, but not including, Lake Ames	FW2-TP(C1)
HIGH MOUNTAIN BROOK (Ringwood) - Source to, but not including, Skyline Lake	FW2-TP(C1)
HOHOKUS BROOK (Hohokus) - Entire length	FW2-NT/SE2
HUDSON RIVER	
(Rockleigh) - River and saline portions of New Jersey tributaries from the New Jersey-New York boundary line in the north to its confluence with the Harlem River, New York	SE1
(Englewood Cliffs) - River and saline portions of New Jersey tributaries from the confluence with the Harlem River, New York to a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, New York)	SE2
TRIBUTARIES	
(Rockleigh) - Freshwater portions of tributaries to the Hudson River in New Jersey	FW2-NT
INDIAN GROVE BROOK (Bernardsville) - Entire length	FW2-TP(C1)
JACKSON BROOK	
(Mine Hill) - Source to the boundary of Hurd Park, Dover	FW2-TP(C1)
(Dover) - Hurd Park to Rockaway River	FW2-NT
JENNINGS CREEK (W. Milford) - State line to Wanaque River	FW2-TP(C1)
JERSEY CITY RESERVOIR (Boonton)	FW2-TM
KANOUSE BROOK (Newfoundland) - Entire length	FW2-TP(C1)
KIKEOUT BROOK (Butler) - Entire length	FW2-NT
KILL VAN KULL (Bayonne) - Westerly from a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, New York)	SE3
LAKE RICKONDA OUTLET STREAM (Monks) - That segment of the outlet stream from Lake Rickonda within Ringwood State Park	FW2-TM(C1)
LAKE STOCKHOLM BROOK	
(Stockholm) - Entire length, except tributaries described separately below	FW2-TP(C1)
(Stockholm) - Portion of westerly tributary, from its	FW1(tp)

origins to about 1000 feet south of the Route 23 bridge, located entirely within the boundaries of the Newark watershed	
(Stockholm) - Brook between Hamburg Turnpike and Vernon-Stockholm Rd. to its confluence with Lake Stockholm Brook, north of Rt. 23	FW1(tp)
LITTLE POND BROOK (Oakland) - Entire length	FW2-TP(C1)
LOANTAKA BROOK	
(Green Village) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Brook and all tributaries within the boundaries of Great Swamp National Wildlife Refuge	FW2-NT(C1)
LUD-DAY BROOK (Camp Garfield) - Source downstream to its confluence with the southwestern outlet stream from Clinton Resevoir just upstream of the confluence of the outlet stream and a tributary from Camp Garfield	FW1
MACOPIN RIVER	
(Newfoundland) - Source to Echo Lake dam	FW2-NT
(Newfoundland) - Echo Lake dam to Pequannock River	FW2-TM
MEADOW BROOK (Wanaque) - Skyline Lake to Wanaque River	FW2-NT
MILL BROOK	
(Randolph) - Source to Rt. 10 bridge	FW2-TP(C1)
(Randolph) - Rt. 10 bridge to Rockaway River	FW2-NT
MONKSVILLE RESERVOIR (Long Pond Iron Works State Park)	FW2-TM(C1)
MORSES CREEK (Linden) - Entire length	FW2-NT/SE3
MOSSMANS BROOK (West Milford) - Source to confluence with Clinton Reservoir	FW2-TP(C1)
MT. TABOR BROOK (Morris Plains) - Entire length	FW2-NT
NEWARK BAY (Newark) - North of an east-west line connecting Elizabethport with Bergen Pt., Bayonne up to the mouths of the Passaic and Hackensack Rivers	SE3
NOSENZO POND (Upper Macopin)	FW2-NT(C1)
OAK RIDGE RESERVOIR (Oak Ridge)	FW2-TM
OAK RIDGE RESERVOIR (Oak Ridge) - Northwestern tributary to Reservoir	FW1(tm)
OHIO BROOK (Morris Township) - Source downstream to Morristown town line	FW2-TM
OVERPECK CREEK (Palisades Park) - Entire length	FW2-NT/SE2
PACACK BROOK	
(Canistear) - Brook and tributaries upstream of	FW1

Canistear Reservoir located entirely within the boundaries of the Newark Watershed	
(Stockholm) - Outlet of Canistear Reservoir to Pequannock River	FW2-NT
PASSAIC RIVER	
(Mendham) - Source to Interstate 287 bridge, except tributaries described separately below	FW2-TP(C1)
(Paterson) - Interstate 287 bridge to Dundee Lake dam	FW2-NT
(Little Falls) - Dundee Lake dam to confluence with Second River	FW2-NT/SE2
(Newark) - Confluence with Second River to mouth	SE3
TRIBUTARIES	
(Great Piece Meadows State Park) - Tributaries within Great Piece Meadows State Park	FW2-NT(C1)
PECKMAN RIVER (Verona) - Entire length	FW2-NT
PEQUANNOCK RIVER	
MAIN STEM	
(Vernon) - Source to confluence with Pacack Brook	FW1(tp)
(Hardyston) - Pacack Brook to, but not including, Macopin Reservoir or the tributaries described separately below	FW2-TM
(Kinnelon) - Macopin Reservoir outlet to Hamburg Turnpike bridge in Pompton Lakes Borough	FW2-TP(C1)
(Riverdale) - Hamburg Turnpike bridge in Pompton Lakes Borough to confluence with Wanaque River	FW2-TM
(Pompton Plains) - Confluence with Wanaque River downstream to confluence with Pompton River	FW2-NT
TRIBUTARIES	
(Copperas Mtn.) - Entire length	FW2-TP(C1)
(Smoke Rise) - Entire length	FW2-TP(C1)
(Green Pond Junction) - Tributary at Green Pond Junction from its origin downstream to Route 23	FW1(tm)
(Jefferson) - Tributary joining the main stem about 3500± feet southeast of the Sussex-Passaic County line, near Jefferson from its origin to about 2000 feet upstream of the pond	FW1(tm)
(Lake Kampfe) - Source to, but not including, Lake Kampfe	FW2-TM
(Lake Kampfe) - Lake Kampfe to Pequannock River, except tributary described separately below	FW2-NT
(Lake Kampfe) - Tributary within the boundaries of Norvin Green State Forest, originating west of Torne Mtn.	FW2-NT(C1)
PILES CREEK (Grasselli) - Entire length	SE3

REFERENCE NO. 11

WESTON

PROJECT NOTE

TO: Hummel Chemical File
DATE: 7-20-94
FROM: Dennis Foerter
W.O. NO.: 04200-016-081-0098
SUBJECT: Sensitive Environments (Hummel Chemical).

- The attached correspondence documents sensitive environments within 4 miles of the Hummel Chemical Site as well as along associated waterways within 15 miles downstream of the Hummel site. This include correspondence with the NJDEPE Division of Parks & Forestry, and the Surface Water Quality Standards.
- In addition a review of National Wetland Inventory Maps was conducted to document the acreage within each Ring of HRS eligible wetlands. This map is in Reference No. 10 of the Hummel Chemical Report). This review indicates the following

Distance Ring (mi)	Wetland Acreage
0-1/4	0
1/4-1/2	1
1/2-1	0
1-2	140
2-3	250
3-4	210
TOTAL	601

- A review of NWI maps also indicates that there is approximately 1.8 miles of estuarine wetlands with the nearest wetland being approximately 1.4 miles downstream from the probable point of entry

Dennis Foerter
7-20-94

rr/RUDKO/PROJECTF.ORM

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

CHRISTINE TODD WHITMAN
Governor

Division of Parks and Forestry
Office of Natural Lands Management
CN 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

ROBERT C. SHINN, JR.
Commissioner

July 13, 1994

Richard Settino
Roy F. Weston, Inc.
Raritan Plaza One, 4th Floor
Edison, NJ 08837

Re: Hummel Chemical and Associated Waterways

Dear Mr. Settino:

Thank you for your data request regarding rare species information for the above referenced project site in Essex, Hudson, Middlesex, and Union Counties.

The Natural Heritage Data Base does not have any records for rare plants, animals, or natural communities on or within one half mile of the Hummel Chemical site. However, there are records for a number of occurrences for rare species which may be on, or in the immediate vicinity of the waterways that you have associated with this site. The attached list provides additional information about these occurrences. Also attached is a list of rare species from records in the general vicinity of the project site (within approximately 4 miles).

Also attached are lists of rare species and natural communities which have been documented from Essex, Hudson, Middlesex, and Union Counties. If suitable habitat is present at the project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife, Endangered and Nongame Species Program.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Arthur Kill, Elizabeth, and Jersey City USGS quadrangles.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Elena A. Williams

Elena A. Williams
Senior Planner
Natural Heritage Program

cc: Lawrence Niles
Thomas Hampton
NHP File No. 94-4007462

13 JUL 1994

ON OR IN THE IMMEDIATE VICINITY OF ASSOCIATED WATERWAYS
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1977-??-??	Y
*** Other types								
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1986-06-??	Y
*** Vascular plants								
LEMNA PERPUSILLA	MINUTE DUCKWEED				G5	S1	1869-08-??	Y

3 Records Processed

13 JUL 1994

GENERAL VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
CISTOTHORUS PLATENSIS	SEDGE WREN		E		G5	S1	1963-??-??	Y
FULICA AMERICANA	AMERICAN COOT				G5	S1	1985-??-??	Y
FULICA AMERICANA	AMERICAN COOT				G5	S1	1986-??-??	Y
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2	1940-??-??	
PODILYMBUS PODICEPS	PIED-BILLED GREBE		E/S		G5	S1	1986-05-16	Y
PODILYMBUS PODICEPS	PIED-BILLED GREBE		E/S		G5	S1	1986-??-??	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1977-??-??	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1976-SUMMR	Y
*** Invertebrates								
LASMIGONA SUBVIRIDIS	GREEN FLOATER	C2			G3	SH	????-??-??	Y
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	LE	E		G1	SH	????-??-??	Y
*** Other types								
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1985-06-??	Y
*** Vascular plants								
LEMNA PERPUSILLA	MINUTE DUCKWEED				G5	S1	????-??-??	Y

12 Records Processed

NATURAL LANDS MANAGEMENT

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEPE Land Use Regulation Program, CN 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 55, No. 35; F.R. 50 CFR 17.11 and 17.12). Federal Status codes reported for species follow the most recent listing.

LE Taxa formally listed as endangered.

LT Taxa formally listed as threatened.

PE Taxa already proposed to be formally listed as endangered.

PT Taxa already proposed to be formally listed as threatened.

C1 Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.

C1* Taxa which may be possibly extinct (although persuasive documentation of extinction has not been made--compare to 3A status).

C2 Taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

C3 Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three subcategories, depending on the reason(s) for removal from consideration.

3A Taxa for which the Service has persuasive evidence of extinction.

3B Names that, on the basis of current taxonomic understanding, do not represent taxa meeting the Act's definition of "species".

3C Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

S/A Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D Declining species-a species which has exhibited a continued decline in population numbers over the years.

E Endangered species-an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.

EX Extirpated species-a species that formerly occurred in New Jersey, but is not now known to exist within the state.

I Introduced species-a species not native to New Jersey that could not have established itself here without the assistance of man.

INC Increasing species-a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.

T Threatened species-a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.

P Peripheral species-a species whose occurrence in New Jersey is at the extreme edge of its present natural range.

S Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.

U Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy has developed a ranking system for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

GLOBAL ELEMENT RANKS

G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state; a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout it's range; with the number of occurrences in the range of 21 to 100.

G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.

GH Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU Possibly in peril range-wide but status uncertain; more information needed.

GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? Species has not yet been ranked.

STATE ELEMENT RANKS

S1 Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

S5 Demonstrably secure in state and essentially ineradicable under present conditions.

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include european strays or western birds on the East Coast and visa-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.

SN Regularly occurring, usually migratory and typically nonbreeding species for which no significant or effective habitat conservation measures can be taken in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in the winter (or, in a few cases, the summer); included also are certain lepidoptera which regularly migrate to a state where they reproduce, but then completely die out every year with no return migration. Species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation. Other nonbreeding, high globally-ranked species (such as the bald eagle, whooping crane or some seal species) which regularly spend some portion of the year at definite localities (and therefore have a valid conservation need in the state) are not ranked SN but rather S1, S2, etc.

SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.

SRF Elements erroneously reported from New Jersey, but this error persists in the literature.

SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.

SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.

T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.

Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.

.1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

Y Identification has been verified and is indicative of significant habitat.

BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

REFERENCE NO. 12

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(203) 767-7644 Fax (203) 767-7069

Jun 9, 1994

To: Jan Holderness
Roy F. Weston Inc
4th Floor Raritan Plaza
Edison, New Jersey 08837-3616

Fr: Bob Frost
Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Hummel Chemical
Newark, Essex County, NJ

CERCLIS: NJD002174712

Job: 04200-016-081-0098-02

Site Longitude: 74-08-01 74.133614
Site Latitude : 40-43-34 40.726109

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the in cluded Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the pro ducts obtained by multiplying each X-coordinate by the difference between the adja cent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

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$$Area = 1/2\{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)\}$$

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "Paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

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================= Site Data =================

Population: 420330.41
Households: 160250.61
Drilled Wells: 93.28
Dug Wells: 15.00
Other Water Sources: 161.42

============= Partial (RING) data ===============

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population: 231819.31
Households: 88616.83
Drilled Wells: 87.58
Dug Wells: 8.61
Other Wells: 108.89

** Population On Private Wells: 251.62

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population: 133561.06
Households: 51461.80
Drilled Wells: 5.70
Dug Wells: 6.39
Other Wells: 45.53

** Population On Private Wells: 31.39

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population: 43833.79
Households: 16240.69
Drilled Wells: 0.00
Dug Wells: 0.00
Other Wells: 1.27

* Population On Private Wells: 0.00

--- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population: 8405.68
Households: 2997.18
Drilled Wells: 0.00
Dug Wells: 0.00
Other Wells: 4.83

* Population On Private Wells: 0.00

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---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	2639.80
Households:	910.37
Drilled Wells:	0.00
Dug Wells:	0.00
Other Wells:	0.90

** Population On Private Wells: 0.00

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	70.77
Households:	23.74
Drilled Wells:	0.00
Dug Wells:	0.00
Other Wells:	0.00

** Population On Private Wells: 0.00

** Total Population On Private Wells: 283.02